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Capital Investment in a Regional Economy:
Some Aspects of the Sources and Employment of
Capital in North Somerset, 1750-1830.

Dissertation submitted for the Degree of Ph.D.

in the University of London

by

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1992

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Sources and Employment of Capital in North Somerset, 1750-1830.

Abstract

The concentration of studies of capital investment on an aggregative approach at the national level has led to an inadequate explanation of the procedures by which capital investment took place. This thesis seeks to achieve a fuller understanding of the process by examining the whole matrix of capital investment in a particular region - north Somerset - for a limited but important period - the early years of industrialization, 1750-1830. The review of the historical context of this region includes a study of the gentry, attorneys, bankers, and merchants, whose interaction is analysed through a broad range of cases drawn from agriculture, mining, manufacture, and transport. The costs involved in the creation of fixed assets and their distribution, the relationship between fixed and circulating capital, and the returns to investment are all subjected to close analysis. The conclusions are, first, that there was a clear distinction between land- or resource-based ventures (enclosures, drainage schemes, mining, transport), financed from within the region, large in structure and with a slowly built up capital input, and the capital- or trade-based enclaves (manufacturing), smaller in scale and dependant upon a network of capital and credit facilities from outside the region, chiefly from Bristol. Secondly, the study shows the importance of legal authorizations (enclosure Acts, partnership agreements), in defining the sources of capital and their outlets. Thirdly, the operation of an impersonal capital market is revealed, based on institutional mortgages (turnpike trusts, improvement commissions). And finally it is shown that both professional (legal, banking, surveying, engineering) and entrepreneurial skills (manufacturers, coal masters, merchants) played a vital part in the supply and employment of capital. The conjunction of this wide range of factors is demonstrated for the first time to be of crucial importance in the process of capital investment in north Somerset.

Acknowledgements

I would like to acknowledge the willing and invaluable assistance received from archivists at the Somerset Record Office, the Bristol Archive Office, the Bath Guildhall Archives, and the Wiltshire Record Office. I would also like to thank the librarians of the Bath University Library (especially the Inter-Library Loan Staff), the Bath Public Reference Library, the Bristol Public Reference Library, and the Weston-super-Mare Public Reference Library. I am further indebted to the staff of the Public Record Office, the House of Lords Record Office, and the British Library.

At a critical point in the history of this research I was much helped by the active support of the late Professor W. Ashworth of the University of Bristol. I should also like to record my debt to Professor T.C.Barker, my Adviser at the University of London.

Lastly I should like to thank my husband and all my family for their continuing and lively interest and support. This work is dedicated to Angus, Andrew, Thomas, Julia, Robert, Helen.

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Buchanan, B.J. 'The Financing of Parliamentary Waste Land Enclosure: Some Evidence from North Somerset, 1770-1830', Agric.Hist.Rev., 30, 2(1982), pp.112-26.

'The Use of Documentary Sources in the Interpretation of Physical Evidence: The Woolley Powder Works near Bristol, a Case Study', 4th International Conference Lyon-Grenoble, 1981, L'etude et la mise en valeur du patrimoine industriel (Paris, 1985), pp.155-60.

'The Evolution of the English Turnpike Trusts: Lessons from a Case Study', Econ.Hist.Rev., 2nd ser. XXXIX, 2(1986), pp.223-43.

'Aspects of Capital Formation: Some Insights from North Somerset, 1750-1830', Southern History, 8(1986), pp.73-93.

'The Turnpike Roads: A Classic Trap?', Jnl.Trans.Hist. 3rd ser. 11, 2(1990), pp.66-72.

Buchanan, B.J. & Tucker, M.T. 'The Manufacture of Gunpowder: A Study of the Documentary and Physical Evidence Relating to the Woolley Powder Works near Bath', Ind.Arch.Rev., 5 (1981), pp.185-202.

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Style and Abbreviations

The change from the Julian to the Gregorian calendar was effected in Great Britain and Ireland by an Act passed in March 1751 (24 Geo.II c.23). This decreed that the first day of 1752 should be 1st January and not 25th March as hitherto, and that the 2nd September of that year should be followed by the 14th September. These changes are marginal to the period covered by this research, but any necessary adjustments have been made.

The more recent changes affecting county boundaries have not been observed, and it is the historic county which is referred to throughout. In the matter of the decimalization of money, the practice adopted has been that of recording the documentary material in the old style because of its greater historical reality, but of decimalising this evidence for working use except where conventions suggest otherwise. Values are always indicated, and historic prices are used throughout. Historic weights and measures are also preserved.

The following abbreviations have been used:

SRO	Somerset Record Office
BAO	Bristol Archive Office
BGA	Bath Guildhall Archives
BRL	Bristol Public Reference Library
BaRL	Bath Public Reference Library
WSM	Weston-super-Mare Public Reference Library
WRO	Wiltshire Record Office
PRO	Public Record Office

Maps of the Region of North Somerset

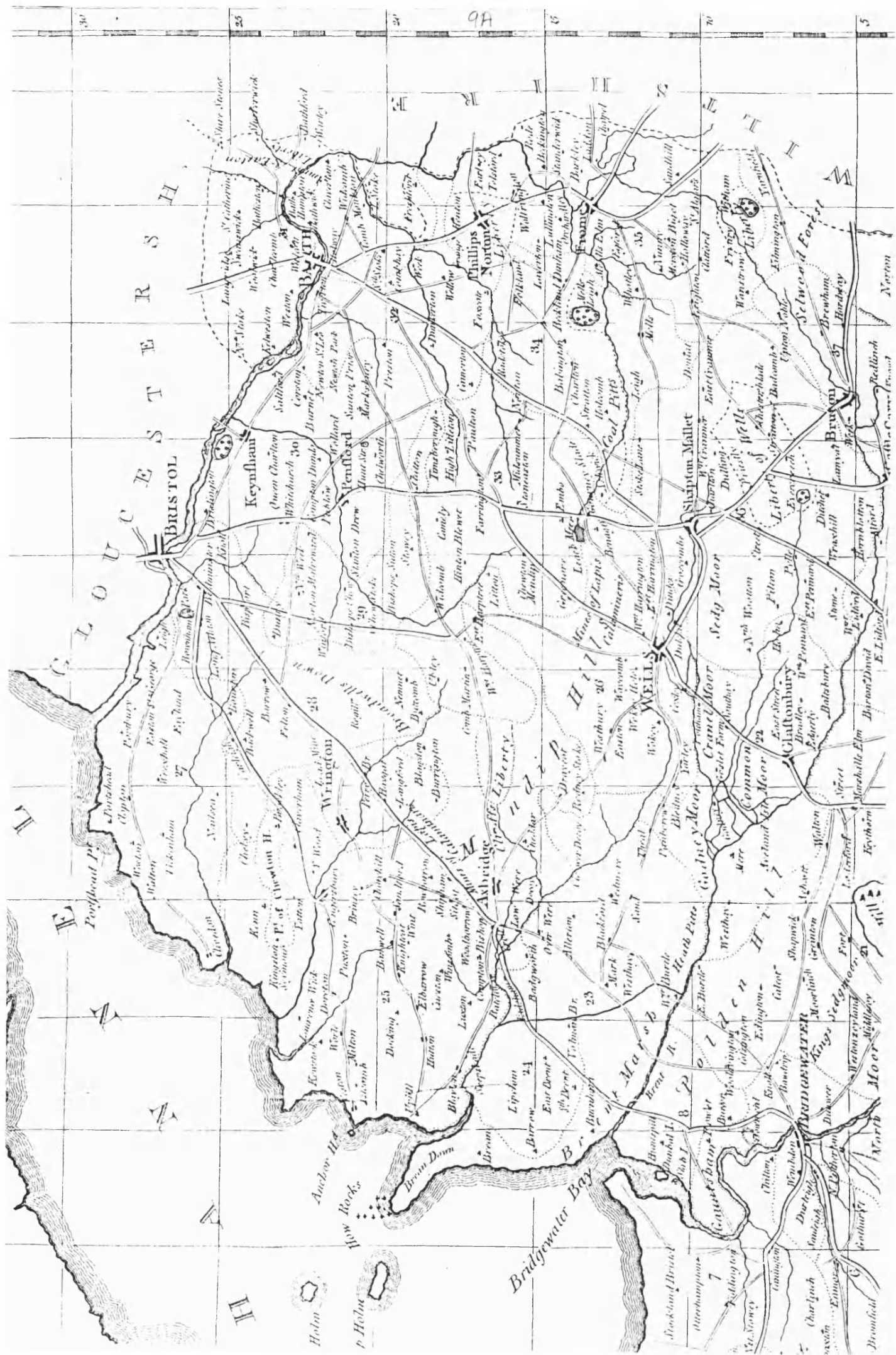
The first is by J.Haywood, 'A Map of Somersetshire engraved from an actual survey with Improvements'. London, 1790.

Scale : $69\frac{1}{2}$ Statute Miles to a Degree
That is, $2\frac{1}{2}$ inches equals 10 miles

All except the southern edge of the region is here clearly defined. This may be taken to run from the mouth of the River Axe near Uphill, along the line of towns below the southern edge of Mendip (Axbridge, Wells, and Shepton Mallet) and so to the eastern boundary near Frome.

The second map shows the parishes within the region. Again the southern boundary can be traced from Uphill on the west coast, through Wells to Frome in the east.

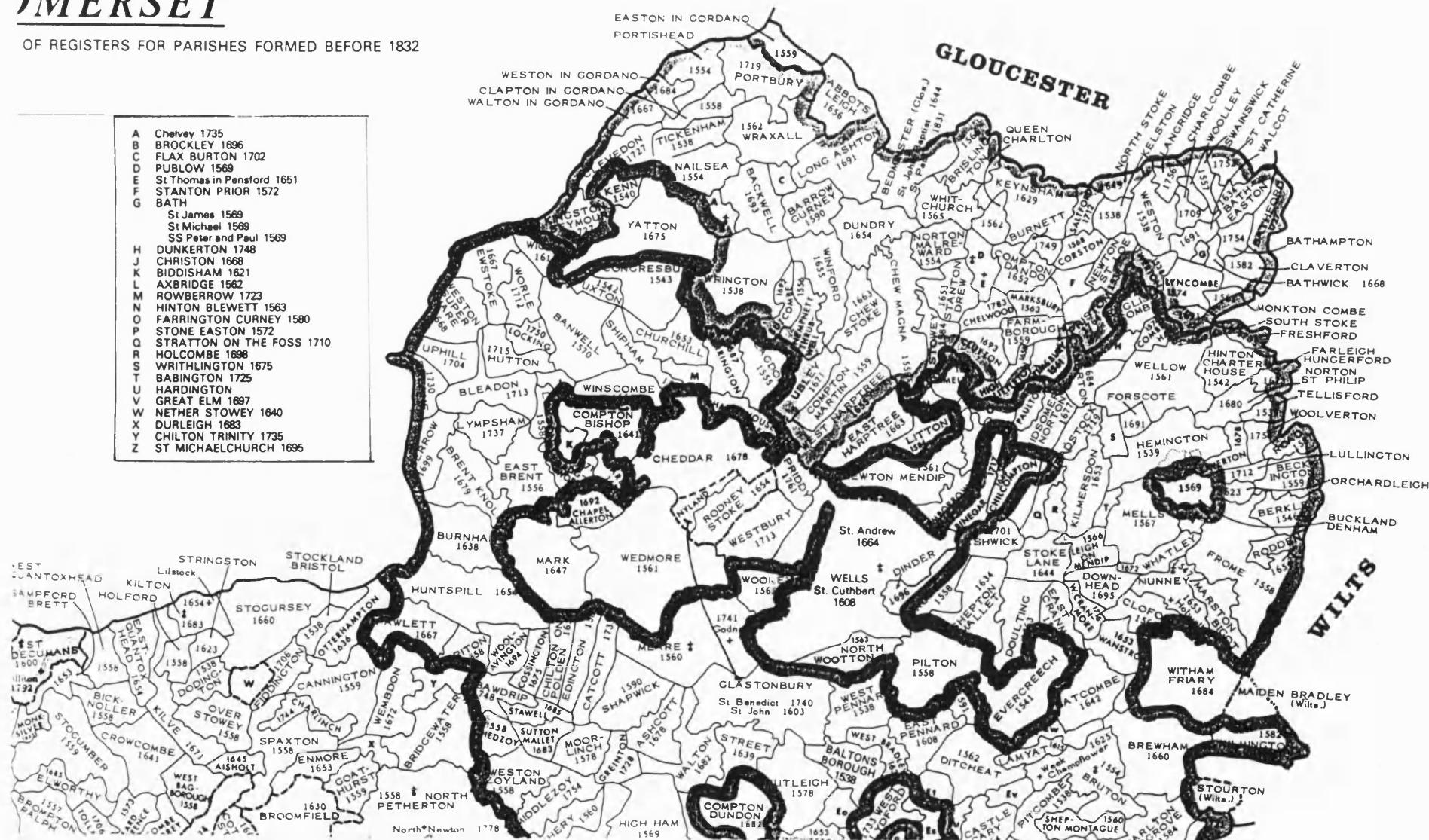
This map is published by the Institute of Heraldic and Genealogical Studies. The dates indicate the commencement of registers for the parishes. The heavy lines show ecclesiastical jurisdictions. The key refers to those few cases where names cannot be written on the map.



SOMERSET

OF REGISTERS FOR PARISHES FORMED BEFORE 1832

A	Chelvey 1735
B	BROCKLEY 1696
C	FLAX BURTON 1702
D	PUBLOW 1569
E	St Thomas in Pensford 1651
F	STANTON PRIOR 1572
G	BATH
	St James 1589
	St Michael 1569
	SS Peter and Paul 1569
H	DUNKERTON 1748
J	CHRISTON 1668
K	BIDDISHAM 1621
L	AXBRIDGE 1562
M	ROWBERROW 1723
N	HINTON BLEWETT 1563
O	FARRINGTON CURNEY 1580
P	STONE EASTON 1572
Q	STRATTON ON THE FOSS 1710
R	HOLCOMBE 1698
S	WRITHLINGTON 1675
T	BABINGTON 1725
U	HARDINGTON
V	GREAT ELM 1687
W	NETHER STOWEY 1640
X	DURLEIGH 1683
Y	CHILTON TRINITY 1735
Z	ST MICHAELCHURCH 1695



Preface

Part of the research on which this thesis is based was undertaken in the 1970s, and an earlier version of this work was submitted to the University of Bristol in 1979 under the title 'Capital Formation in North Somerset, 1750-1830'. The aim was to explore the process of capital formation in a regional economy. This approach proved unacceptable to the examiners on the grounds that capital formation was an aggregative concept to be pursued at the national level. My work was not in the 'mainstream' approach to the subject. With the support of my supervisors the thesis was withdrawn, and successful negotiations were undertaken to submit a new version of my work to the University of London. An early submission was anticipated but this has been delayed for several reasons.

First, my earlier work has now been supplemented by much new research, especially on the regional context within which the process of economic change was embedded. Next, with the purpose of sounding out the wider response within the economic history profession to the ideas developed in the first version of this thesis, a number of articles have been published in the intervening years. These have been favourably received, largely because of the originality of approach. Research upon the Parliamentary enclosure of common and waste land, published in the Agricultural History Review, gave a new emphasis to the importance of land sales as a method of financing costs, and

drew attention to the failure of earlier studies to take this into account because of their concentration on the open fields¹. This contribution to the subject was acknowledged by Michael Turner, then working on a comprehensive account of enclosures, and led to a modification of his view that such sales were but a minor feature of this process².

An article on the financing of the turnpike roads was based on the Bath Trust, but placed in the context of other case studies and of national surveys and aggregative work³. It was welcomed by the expert reader of the Economic History Review as being 'very, very new'. He asked for more not less of the specific evidence upon which my criticisms of the aggregative approach were based. I therefore developed further the charge that by ignoring the renewal and amendment Acts which determined the length and organization of the turnpike trusts, aggregative studies had shown themselves to be incapable of dealing with the complexities of historical reality. Their findings were therefore suspect. Amongst historians of the turnpike trusts these strictures were received sympathetically, as shown for example by a review of the article in the bibliography published annually in the Journal of Transport History⁴. Since then it has been observed in a study of the Staffordshire turnpikes that the evidence for that county 'underlines the necessity recognised by Buchanan to examine such subsequent Acts in any study of turnpike evolution'⁵.

The author upon whose thesis I had commented critically did not respond so warmly, and when his research came to form the basis of a contribution to the major work on capital formation published recently, my observations were dismissed in a first footnote as demonstrating the fallacy of generalizing from a single case⁶. In responding to this charge I have expanded upon the misjudgements underlying the aggregative approach adopted by this author, in an article published in the Journal of Transport History⁷. It does not seem an exaggeration to suggest that this dispute is about more than the financing of the turnpike roads. It is also about the role of the aggregative method in historical studies, and the discomfort of its practitioners when challenged about the inadequacy of their approach and the inaccuracies of their results.

A more comprehensive article on capital formation in north Somerset in the years 1750 to 1830, published in Southern History, represented an attempt to explore the ways in which historical evidence on the sources of finance and its investment can be used to investigate the processes by which capital was formed in the regional economy⁸. This exercise caught the eye of the Economic History Review's assessor of the many periodicals published in the year 1986. She drew attention to the importance of 'the study of markets, middlemen, commercial organization, and credit' which, my article suggested, 'may tell us more about the first industrial revolution than the traditional industrial and fixed capital

studies'. The reviewer went on to summarize the nub of my article that, 'trade-based undertakings in Somerset at first stimulated then retarded developments in the region. Manufacturing ventures remained a part of the merchanting network instead of becoming agents of industrialization'⁹.

This argument was based in part upon evidence from the local gunpowder industry, which had already been the subject of contributions to American and French journals¹⁰ when it received fuller analysis in an article in the Industrial Archaeology Review¹¹. In this piece the task of surveying the physical evidence, drawing up plans and elevations, and writing an appendix on water power was undertaken by my associate. The documentary evidence, historical interpretation, and writing of the text was my work, drawing upon some of the material already in my first thesis. This important industry in the Bristol region had been previously entirely neglected, but by emphasising its significance in relation to Bristol merchant capital, credit, and trade (especially the Africa trade) in the eighteenth century, and its importance at that time within the overall history of this industry at the national level, its great consequence is becoming recognized.

Tables setting out the financial structure of one of the gunpowder partnerships are included in the new version of my thesis. But then such tables were also in the earlier one, and for other sectors of the regional economy as well as the

gunpowder industry. They are included because it is believed that such statistical information provides evidence from which an analysis of the process of capital formation can be attempted. It does not however present a firm enough basis from which to undertake an aggregative study, even at the regional level, and as it seemed in the late 1970s that the definitive programme for current and future research into capital formation in its historical perspective had been set by the research plans of Charles Feinstein, Sidney Pollard, and their colleagues, the future prospects for my own approach to the subject did not look promising. But the situation is now changing and I am encouraged to submit my thesis in its new, revised, and expanded form, because I think that this last reason for my delay is becoming less significant.

Not only does the now generally favourable response to my articles indicate a growing change of attitude within the profession itself (exemplified also by recently published studies such as that edited by Pat Hudson under the title of Regions and Industries¹²), but the possibility that the time has come for a start to be made on a wider approach towards an understanding of the process of economic change is suggested by the disappointing results of studies undertaken on an aggregative basis over the last two decades. These have culminated in the publication of the finished work of Charles Feinstein, Sidney Pollard et al in 1988, which shows that there has been little development since the preliminary survey of the

research project was published in 1971¹³. Problems of definition and evidence remain unsolved, and the question of the process of capital formation in its historical context still lies beyond the scope of the different contributions. This research tool has not lived up to its earlier promise and the expectations of the profession.

The challenge of contemporary scholarship is now seen increasingly to be that of teasing out answers to tangible problems, particularly at the regional level, and on a quantitative but non-aggregative basis. It is because the focus of economic historians is becoming less narrowly fixed on the aggregative approach at the national level, and more broadly appreciative of attempts to seek answers to problems through the analysis of the interplay of factors at the regional level, that it now seems appropriate to submit this research for consideration by the University of London.

- 1 B.J.Buchanan, 'The Financing of Parliamentary Waste Land Enclosure: Some Evidence from North Somerset, 1770-1830', Agric.Hist.Rev., 30,2(1982), pp.112-26.
- 2 Michael Turner, 'Cost, Finance, and Parliamentary Enclosure', Econ.Hist.Rev., 2nd ser. XXXIV, 2(1981), pp.236-48, esp. p.241; also his Enclosures in Britain 1750-1830 (1984), pp.7 & 59.
- 3 B.J.Buchanan, 'The Evolution of the English Turnpike Trusts: Lessons from a Case Study', Econ.Hist.Rev., 2nd ser. XXXIX, 2, (1986) pp.223-43.
- 4 P.J.Cain, 'Bibliography of transport history in other periodicals, 1985-86', Jnl.Trans.Hist., 3rd ser. 8, 2(1987), pp.202-09, especially pp.202-03.
- 5 A.D.M.Phillips & B.J.Turton, 'Staffordshire turnpike trusts', Jnl.Trans.Hist., 3rd ser. 8, 2(1987), pp.126-45. See p.127.
- 6 John Ginarlis & Sidney Pollard, 'Roads and Waterways, 1750-1850', in Charles H. Feinstein & Sydney Pollard eds., Studies in Capital Formation in the United Kingdom 1750-1920 (Oxford, 1988), pp.182-224.
- 7 B.J.Buchanan, 'The turnpike roads: a classic trap?', Jnl.Trans.Hist., 3rd ser. 11, 2(1990), pp.66-72.
- 8 B.J.Buchanan, 'Aspects of Capital Formation: Some Insights from North Somerset, 1750-1830', Southern Hist., 8(1986), pp.73-93.
- 9 Pat Hudson, 'Review of Periodical Literature in 1986, 1700-1850', Econ.Hist.Rev., 2nd ser. XLI, 1(1988), pp.132-7. See p.134.
- 10 B.J.Buchanan, 'Comment on the Manufacture of Black Powder', Jnl.Soc.Ind.Arch., 2(Univ. West Virginia, 1976), pp.75-80; and 'The use of documentary sources in the interpretation of physical evidence: the Woolley powder works near Bristol', 4th Conf. Internat. Lyon-Grenoble, 1981, L'étude et la mise en valeur du patrimoine industriel (1985).
- 11 B.J.Buchanan & M.T.Tucker, 'The Manufacture of Gunpowder: A Study of the Documentary and Physical Evidence Relating to the Woolley Powder Works near Bath', Ind.Arch.Rev., 5(1981), pp.185-202
- 12 Pat Hudson ed., Regions and Industries, a perspective on the industrial revolution in Britain (Cambridge, 1989).
- 13 J.P.P.Higgins & Sidney Pollard eds., Aspects of Capital Investment in Great Britain, A Preliminary Survey (1971); Feinstein & Pollard eds., Studies in Capital Formation (1988).

Introduction

The aim of this thesis is to investigate the process of capital investment in a regional economy, through an analysis of the sources and productive employment of capital in north Somerset between the years 1750 and 1830. It is intended to point out some of the shortcomings in past studies of capital formation and to indicate from work in this region how these weaknesses may be overcome. These aims are based on the premise that the study of capital formation has both a measurable aspect, concerning the increase of stock over time, and a narrative dimension, concerning the explanation of the process by which capital formation has taken place. Most previous studies in this field have concentrated on the first element to the neglect of the second, and this narrowing of the subject has resulted in a loss to our understanding in both respects - to the quantitative aspect because this would benefit from a greater infusion of empirical evidence than it has so far been given, and to the study of the process of capital formation because this has hitherto received little attention.

This over-emphasis on measurement is particularly regrettable for the crucial years of the British industrial revolution, as the documentary evidence for this period is too insubstantial to bear interpretation by the quantitative approach alone. The authors of British Economic Growth 1856-1973 have observed that in going back beyond the mid-nineteenth

century, data limitations weaken the value of national income accounting relative to other methods¹, whilst a distinguished reviewer of the recently published Studies in Capital Formation in the United Kingdom, 1750-1920 has warned researchers that despite the 'cornucopia of figures....there is not a lot of firm bedrock in any of..(them for)...the underlying data are patchy, discontinuous, and often no more than contemporaries' hunches that chance to have been expressed in numbers as well as words'². Even more pertinent from the point of view of the present study is the further criticism that 'If there is any relationship between the thematic or sectoral chapters..and the work on the national statistics...it is nowhere mentioned and...the two parts of the book proceed in stately independence towards interesting but not altogether consistent conclusions'³. Yet this is the volume that marks the culmination of more than twenty years research by a large and talented team, concerned with the estimation of the capital employed in the national economy over the years from 1750. The severe doubts raised by the finished work range from the poor quality of the underlying data and the failure to knit together the sectoral studies with the estimates for the national economy, already mentioned, to the complete neglect of the question which would provide a significant context for all this effort, namely the matter of the process by which investment was undertaken and capital thus formed.

There could be no clearer indication of the need for a fresh view than this failure by the 'mainstream' approach to look beyond the task of charting economic change, to that of interpreting and understanding it. In contrast, the focus of this research is the investigation, analysis, and interpretation of the investment process, here taken to mean the sources of capital, the means of its transfer, and the productive assets created. The study of this process is central to the thesis. The analysis is conducted in a quantitative but not aggregative manner. The evidence is interpreted in narrative form, which is essential if links and processes are to be established and explained. The relationships surveyed include not only those between the sources of capital and its uses, but also wider matters such as the largely unexplored bridges between the commercial and industrial communities. The physical closeness and financial links between north Somerset and the major port of Bristol provide an opportunity for this relationship to be investigated in some detail.

Reliance on historical evidence produces several problems, of which three particular constraints must be mentioned. The first relates to timing, for only from the mid-eighteenth century was there in north Somerset a beginning of that accumulation and continuity of primary evidence judged to be essential for a sustained analysis of capital investment. With the coming of the railways in the 1830s, and the attendant changes in forms of transport and methods of finance, the

period covered by this research ends. The second constraint relates to the range of evidence available, which is inevitably limited by special circumstances. Primary sources may have survived because they were of an institutional nature (the papers of turnpike trusts, improvement commissioners); or constituted a legal claim or title to land (enclosure awards); or authorized the collection of a rate (drainage commissions), or because they had been filed with family or estate papers (mining and manufacturing concerns). Not only does this mean that detailed and continuous evidence has rarely survived for significant aspects such as residential building, routine agricultural investment, and many manufacturing concerns, but also that even amongst more fruitful sources such as the turnpike trusts, such material is unlikely to be comprehensively available. To some extent these difficulties can be eased by reference to secondary sources, but there remains the problem of assimilation, of judging the weight of generalization which can be borne by possibly unrepresentative evidence. Third, the material which has survived may not be available in a form capable of yielding easily the kind of information being sought. Considerable ingenuity was required to derive evidence on the capital involved in enclosures from the sums raised by the sale of land as recorded in the awards, and to reconstitute the finances of the Bath Trust from its mortgage deeds in a way which reveals when capital sums were raised, and not simply when they were authorized. The decoding of brass company papers posed a further challenge.

Of the several criticisms to which this reliance on an historical approach can give rise, two of the most important are that the coverage may be too limited and the presentation too detailed. The former has already been acknowledged, and provided the available primary and secondary works are consulted, then the generalizations formed in the course of traditional research are no more hazardous than those issuing from the aggregation of deficient data on a statistical basis. Indeed, there may even be certain advantages, for unlike the aggregative case, the precision of the particular is not lost within the whole, and the extent of the generalization is more likely to remain clear.

On the second point, it has to be admitted that detail may become a morass of information from which no conclusions will ever emerge. But the skill of the historian lies in assembling appropriate evidence from which, if the right questions are asked, significant answers may be drawn. It is greatly to the discredit of the historical profession that when seeking to criticise detailed work of a local character the word 'antiquarian' is used as a term of abuse. This is not to condone naive and inadequate research, but to recognize the importance in their own time of the largely topographical studies pursued in the past, on the basis of the collection and classification of observable data. Not all the problems grappled with then can be answered now, even by using modern techniques. As to the role of detail, there is mounting

evidence that some current research suffers from a paucity rather than an excess of this, to the extent that in a review of current literature John Chartres was moved to observe that he may have detected the origins of 'pseudometric history'⁵.

This thesis begins with a survey of the historiography of capital formation so that the study may be placed in the context of different approaches to the subject of capital investment. It includes a review of current literature and a consideration of problems of concept and method. In Part II there is a survey of the historical and geographical context of north Somerset, which includes an account of its population, settlement patterns, and social structure; the interactions with Bristol; and the activities of professionals in the area. A survey of these aspects of the regional economy is new, and of especial originality is the analysis of the Commissions of the Peace and the Law Lists in order to build up registers of information about the gentry and the attorneys respectively. Part III is given over to an account and analysis of the investment of capital in north Somerset in the given years, in a range of cases drawn from agriculture, mining, manufacture, and transport. The aim is that of identifying the sources of capital, the means of its transfer, and the manner of its productive employment in these different branches of the economy. Where possible tables of figures have been assembled

within the general narrative of the thesis, so that the links and relationships underlying investment can be explained through both. Problems of evidence preclude a comprehensive coverage, but efforts have been made to link the specific evidence with that more generally available on the region. In conclusion an interpretation of the process of capital investment and its influence on economic change within the region will be suggested, based on an analysis of the pattern of the different forms of economic activity in north Somerset.

1 R.C.O. Matthews, C.H. Feinstein & J.C. Odling-Smee, British Economic Growth 1856-1973 (Oxford, 1982), p.5.

2 F.M.L. Thompson, Review of Pollard & Feinstein eds., Studies in Capital Formation (1988), Agric. Hist. Rev., 37, 1 (1989), pp.104-05.

3 Ibid., p.105.

4 J.A. Chartres, 'Review of Periodical Literature, 1978', Econ. Hist. Rev., 2nd ser. XXXIII, 1 (1980), p.137.

Part I The Historiography of Capital Formation.

Chapter 1 A Review of General Issues

i Survey of Relevant Literature.

The analysis of the growth of the major industrial economies of the world, especially that of Great Britain during the classical period of the industrial revolution from the mid-eighteenth century to the 1830s, has in recent years focussed on the role of capital formation in these changes. Detailed statistical series have been built up, but despite the interest generated by these attempts to quantify the investment of capital, the subject remains in an unsatisfactory state. In his welcoming 'Foreword' to Pat Hudson's volume on The Genesis of Industrial Capital, Francois Crouzet cautioned that, 'in computing national investment proportions the essential spadework of collecting and interpreting new data has sometimes been neglected'¹. But the problem may be deeper than this tendency to neglect historical research, relying on statistical techniques in the effort to attach numbers to the amount and proportions of capital invested. It may also reflect the continuing failure to flesh out the subject by analysing the way in which productive assets were created.

The importance of the process of capital formation is of internationally acknowledged significance. In the introduction

to The Industrial Economies : Capital, Labour and Enterprise, Robert Solow and Peter Temin point out that it is as important to ask how capital investment was motivated and financed as to know how much of the growth of output was attributable to such investment'². Yet there have been no comprehensive answers to the first question. C.H. Feinstein's contribution to the volume is outstanding, but by focussing on the investment side of the process to the exclusion of the savings and finance aspects he thereby excludes the study of the process of capital formation³. Instead the reader is directed in a footnote to the discussion of the supply of capital in Crouzet's editorial introduction to Capital Formation in the Industrial Revolution, which cannot be regarded as providing a full consideration of the matter⁴. The question raised by Solow and Temin was not dealt with any more satisfactorily by other writers, whose difficulties of data and interpretation may be said to have been summed up by the conclusion of the American contributors that 'From this mixed evidence a hazy picture emerges'⁵.

In a similar work of many talents, nine leading scholars have contributed to the Studies in Capital Formation in the United Kingdom, 1750-1920⁶. This volume was long awaited as participants had first come together twenty years earlier in an attempt to estimate the amount of capital invested in Britain in the period of the industrial revolution, and to assess its role in the growth of output and productivity. A comparison of their finished work with the progress report published in 1971⁷

shows that one subject, shipping, was lost along the way, and that although there are useful additions including the iron industry, woollen textiles, corn milling, and steam power, there are still regrettable omissions especially ^{non-ferrous} ~~metalliferous~~ mining, the brass and copper industries, chemicals including gunpowder, pottery and other lesser aspects of manufacturing industry, railways, passenger and goods carriers and, perhaps most significant of all considering its importance within the national domestic capital stock, housing.

The recital of this list of omissions shows that Feinstein's recognition in an earlier work that 'so much still remains to be done on the individual sectors which can alone provide a proper foundation for aggregate estimates', has not borne fruit in the present volume⁸. For those sectors which are included most contributors have tried to achieve a national coverage, though even here there are anomalies such as the chapter on steam power, devoted to one firm, and that on insurance policies, viewed chiefly as a source of evidence⁹. The chapters also vary as to their completion date, which has affected the incorporation of new research. That by Ginarlis and Pollard for example relies heavily on the former's thesis of 1970, although the authors avoid revealing that date in their citation of the work. Footnotes carry no references later than the 1960s, except for a summary dismissal of my own work of 1986 on the evolution of the turnpike trusts. The substantial work by J.R. Ward on canals, of 1974, receives no mention¹⁰.

The text of B.A.Holderness' study, completed in 1980, is mentioned not because it is out of date but since it exemplifies the problem of congruity between the sectoral and aggregative studies. Both he and Feinstein tried to quantify agricultural investment on the basis of landlord's rents, but from their different data and calculations they achieve different results, about which they then fail to enlighten the reader by any reference to the other's work, other than a formal mention¹¹. The editors' argument that in both parts of this volume 'the very variety of source and method must help to cancel out errors and prevent the cumulation of bias', does not inspire confidence. Nor does the fact that in for example Feinstein's series for manufacturing plant and machinery the basis of calculation was so greatly changed that the estimates for fixed capital formation before and after the mid-nineteenth century could only be made to cohere by raising the earlier ones by 37 per cent. Feinstein concedes that 'extreme caution should be exercised by all users of this structure'¹².

The pitfalls in the compilation of the estimates presented in Part II have been made so clear by Feinstein that there will be scope for revision and improvement for some time to come. The future of the kind of studies undertaken in Part I is less clear because they fall between two stools, being neither sufficiently statistically-oriented to benefit from the speculative approach adopted successfully in the building up of the national aggregates, nor sufficiently historically-rooted

to be capable of meeting the demands of interpretation which is the mark of the valid historical study. The sectoral and thematic studies therefore do little to add to Feinstein's work, without having found an independent role that is important in its own right. This does not mean that there is no future for studies of capital formation of a non-statistical sort, but that the most satisfactory form of research to complement the estimation of the national aggregates would be that which investigates the process of capital investment.

The historical method of research is well suited to this challenge. Attention to the framework and mechanisms of change can give the subject a structure which is multi-faceted rather than one-dimensional as at present. This would breathe fresh life into an area of study which is in danger of languishing because of its detachment from the history of the social and economic systems in which it should be rooted. This approach can also stave off the most fundamental criticism of the narrower focus seen in the volume edited by Feinstein and Pollard, which is that it fails to interpret and explain its subject. It may be that in the study of capital formation in an historical context, the limits of useful quantification have been reached.

Before going on to consider the concepts, methods, and evidence to be used in such an approach, reference must be made to other works published in the years since a major study of

capital formation was first mooted in Sheffield in 1969. Despite the significance of this matter, there have been few comprehensive studies of capital investment. Particularly disappointing from the Bristol point of view is the Liverpool University project entitled The Supply of Capital and the Economic Development of Merseyside 1690-1880, for this produced no report of substance. The document finally deposited with the S.S.R.C. reads more like a prospectus than a report on finished work¹³. Other studies on a regional basis have been restricted to a post-1830 or even later period, by data limitations. This suggests that although such deficiencies may be masked by statistical techniques, the availability of data determines the areas, periods, and sectors chosen in this field just as much as for the more traditional 'source-oriented' historians. A.G.Kenwood's study of north-eastern England exemplifies this point, whilst his 'Fixed Capital on Merseyside, 1800-1913' is misleadingly titled for the work is limited largely to construction activity in the years from 1838, and contains little reference to the sources of capital and the mode of its employment. South Wales has since claimed Kenwood's attention, but attention is still focussed on later decades¹⁴. Scottish studies like those by John Butt on iron and cotton, Ian Donnachie on brewing and T.M.Devine on tobacco have identified sources of capital but say little on the processes of its formation¹⁵.

In the gestation period of the Sheffield project several of the contributors have published valuable interim studies, for example Pollard on British coal production, which aims to establish output and capital costs and hence capital formation, and Holderness on landlord's capital formation in East Anglia, which has convinced him 'estate investment was not the whole of the matter'¹⁶. In textiles much of both D.T.Jenkin's study of fixed capital formation in the West Riding woollen industry and of S.D.Chapman's work on cotton manufacture are based on insurance records, and so subject to the possible inaccuracies of these indicators of financial assets. When the latter steps outside the conceptual constraints imposed by a concentration on the estimation of fixed capital alone, as in his study of the financial environment within which firms operated in the years 1790 to 1850, especially as regards the period of credit they were allowed, then he is able to add greatly to our understanding of the neglected theme of the relationship between fixed and working capital¹⁷. But even when attention has been paid to the sources of finance by these authors and by others not associated with the project such as J.R.Ward in his work on canal finance, as mentioned, it would probably still be true to say that a consideration of the processes by which capital was formed is lacking.

C.W.Chalklin and R.S.Neale have described the context of capital formation in building, and are concerned with a 'process' and a 'product' respectively, but they are limited by

the chosen sector and urban setting¹⁸. Many business histories are similarly disappointing. In the statistical appendix to B.W.E.Alford's study of W.D.& H.O.Wills for example, the analysis of this Bristol firm is concerned primarily with the partners' profits and not with the composition of the total capital employed and the credit position of the firm, still less with the sources of capital and the mode of its employment. Other business historians have varied from the disdain for capital and finance shown in Charles Wilson's study of Unilever and W.J.Reader's of I.C.I., to the interest in these aspects displayed in D.C.Coleman's work on the paper industry and Courtaulds. The writings of W.E.Minchinton on the British tinplate industry, Peter Mathias on brewing, R.H. Campbell on the Carron Company, and Alan Birch on iron and steel, all devote space to financial matters, but the range of information conveyed varies greatly, and all suffer the disadvantage of not having been conceived with an enquiry into capital formation in mind¹⁹.

This criticism cannot be levied at J.Ginswick's study of the Australian Gaslight Company, with its quantification and analysis of capital. This case study is concerned with more than measurement, it also analyses the legal framework within which the company operated, the sources of finance in the colony and Great Britain, and the process by which this was converted into real assets²⁰. Similarly with Lorna Weatherill's studies of the pottery industry. The evidence assembled is not

susceptible to analysis at an aggregate level, but meets the more modest aim of providing information on the structure of the capital employed by businesses which were small relative to many enterprises in for example textiles and ironworking. It is shown that capital was 'invested in financing credit to the wholesale and retail trades' rather than the more usual reversal of this position, a conclusion which reveals the importance of studying the financing of firms in their context, rather than in the isolation of their own business organization²¹.

Of all the works of economic history published in the last ten years, none has seemed more encouraging than that by Pat Hudson on The Genesis of Industrial Capital. This study shows a welcome awareness of the importance of the process of capital formation: it embraces theory, yet is based on a thorough examination of the relevant archives; it is concerned with what happened in a sector of a regional economy, rather than with speculation about some nebulous aggregative whole; and it places the topic under review firmly in its historical context by seeing economic change, especially the financing of factory industry in Yorkshire, as an 'embedded process impossible to extract from the plethora of non-economic relationships'. This approach has been rewarding, not only because it gives an understanding of the financing of factory production in one region, but also because it raises questions of a wider significance including the relative importance of landed

resources, mercantile funds, and ploughed-back profits, and the relationship between fixed and circulating capital in financing industrial change²². Another lesson to be learnt from this work is the author's avoidance of the term 'capital formation', for its current narrow interpretation has made its use unwise in anything other than aggregative studies. Hudson has circumvented this problem by writing of 'capital accumulation'. It is hoped to achieve the same dispensation by adopting the term 'capital investment' in this research.

The dearth of studies on the context and circumstance of economic change in Britain has begun to arouse comment. From the vantage point of a survey of periodical literature in the Economic History Review of 1990, Katrina Honeyman has concluded that for the years 1700 to 1850 'Interest in the speed and extent of Britain's transformation seems to be evaporating, and industry itself formed the basis of very few articles of note in 1988'. In the same journal in 1988, in a lukewarm review of Studies in Capital Formation, W.A.Cole observed that the importance of this work would 'largely depend on the reliability of the estimates it contains', which the authors had so far failed to interpret and assess. His hope that they would remedy this by participating in 'the renewed debate on the role of capital formation which publication of this volume is likely to provoke' shows no great conviction that aggregative studies at the sectoral or national level have a lively future ahead of them. The more rewarding prospects may

therefore beckon for research which in the words of Crouzet's 'Foreword' to Hudson's book, 'brings back the debate to earth'²³.

ii Concepts and Definitions.

Historians have so far paid little attention to the problem of how capital is formed, yet there is no lack of challenge in seeking to explain this matter which is of importance to economic theory as well as to empirical economic history, since it involves analyses of the flow of savings, the role of financial intermediaries, and the act of investment in the creation of productive assets²⁴. The reluctance to explore these relationships may not however arise from a failure to appreciate their significance but from the many difficulties of a conceptual, methodological, and evidential nature which must be faced. Of these the conceptual problems arise less from the difficulty of importing ideas refined for use in economics into the different discipline of history, than from the disparity between concept and evidence to be found in both. In economics this may be seen in the theoretical problems inherent in the measurement of capital and the practical difficulties involved in the construction of estimates in developing countries. It was after all the economist Joan Robinson who remarked in the context of a modern study of capital accumulation that 'it is of no use framing definitions more precise than the subject-matter to which they apply'²⁵.

Further evidence of the shared nature of the conceptual problems comes from another outstanding figure in this field, Simon Kuznets who has stated that 'No standard definition of capital formation exists at present; and I doubt whether one is desirable now', for in the pursuit of 'different analytical purposes and problems' different definitions may be appropriate²⁶. These remarks do not imply that the subject is in disarray, but that a distinction must be drawn between the broad terms of the general concept and the precise definition of its application to particular circumstances. This flexibility is desirable in the historical context too, if the development of our knowledge of the processes of capital formation is not to be constrained. The subject is more than a bundle of techniques for the collection of data, it is also a system of ideas, and however much it may be necessary to delineate acceptable procedures for the purposes of measurement, to achieve comparability of data, it is essential that the concept itself should not be confined within too close or 'standard' a definition. To do so would be to introduce an authoritarian note into the pursuit of the subject, depriving it of much of its interest and scope for development.

A definition of capital formation as :

"Additions made during a particular period of time to the stock of goods which are for use in future production. These are both fixed assets, such as buildings, items of plant and so on, and work in progress, stocks of raw materials and finished goods"

was proposed by the economist J.Hibbert at the conference in Sheffield to launch the major study already referred to²⁷. Its general acceptability to economic historians was shown in its adoption by Crouzet, editor of essays on Capital Formation in the Industrial Revolution, although it is there relegated to a footnote and there is little discussion of conceptual problems in the book as a whole²⁸. Feinstein and Pollard also fail to consider the matter, announcing that their recently published volume was 'not the place to debate, once again, the meaning of "capital".'²⁹.

For present purposes Hibbert's definition is acceptable, provided the term 'additions' can be taken to mean both the incrementation of capital stock, and the process by which this was made. The case for a broad understanding is that 'real capital' as a factor of production and 'money capital' as yet-uninvested finance are complementary terms which embody the two sides of the investment process. Both are to be distinguished from stocks, bonds, and money claims, which represent a relationship between creditors and debtors. Capital goods (which may range from the narrowest category of commodities used by business enterprises, to the broadest including all economic goods) are purchased by financial capital. The accommodation of the two distinguishable aspects within the one concept has been expressed by Kuznets:

By capital formation we understand the addition to
...existing stocks of capital goods; or the flow of

the means of payment that become available for the financing of additions to such stocks'³⁰.

In the study of capital formation it is thus as legitimate to investigate the flow of the means of payment as it is to measure the additions to capital stock. The two are part of the same process.

Despite the harmonization of these two aspects in one broad concept it is not at present advisable to use the term capital formation to cover both, for through a restrictive understanding of the term it has become associated with exercises in measurement and an aggregative approach, rather than with an exploration of the whole process. The term 'investment' offers a way of avoiding the dilemma, although this alternative has sometimes itself been thought so hazardous its use has been discouraged. I refer here to both the United Nations report on Concepts and Definitions of Capital Formation which states that since the term investment generally signifies '...the acquisition of securities and other financial claims, its use has been avoided', and the Central Statistical Office Publication, Sources and Methods: National Accounts Statistics which notes that 'Investment in fixed assets and stocks is described as capital formation to distinguish it from investment in financial assets'³¹. Some have tried to avoid a charge of error in this matter by using both terms, a group of American scholars expressing this option neatly with the words,

'Investment (sometimes called capital formation)...'³². But this line of defence is ambiguous, and it is preferable to take a more positive approach and seek merit in the adoption of the term 'investment'.

In this study capital investment is taken to mean in general the productive use of current resources to achieve a future return, and in particular the conversion of monetary savings into actual additions to physical assets. The process involves three separate but interdependent activities of which saving is the making available of resources through the setting aside of current consumption; finance is the intermediary function enabling the transfer of funds from savers to investors; and investment is the activity by which resources are used in the production of capital goods. All played an important role in the growth of income and productivity in the years known conventionally as the industrial revolution. It is a great advantage of this term that it allows research to be conducted as an open-ended enquiry, whereas studies of capital formation have been driven into a cul-de-sac by their narrow concern with the measurement of 'fixed' and durable goods (for example, farms, drainage works, mines, machines, roads, and canals), frequently to the exclusion of the study of working capital in the form of raw materials, semi-manufactured goods, and finished items held by manufacturers and traders. The study of capital investment however allows for a more comprehensive and less dogmatic approach.

A further merit of the term is that through its concern with the financing of the flow of additions to capital stock, investment can be seen as the active element at the heart of the subject. As such it presents a number of practical problems, of which a major difficulty is the identification of particular sources of funds with a specific use, especially as in an historical context the rudimentary forms of financial organization may limit or delay the matching up of pools of savings of an unrealized potential, with areas of unsatisfied demand. But whereas in this matter of linkages between savers and investors the functioning of attorneys or the development of banks may be subject to detailed historical investigation as to numbers and forms of organization, the role of the entrepreneur is more difficult to establish. Yet he was often the catalyst who, by undertaking the process of investment, transformed savings into capital stock. These matters serve as a reminder of the human motivation and commercial organization which are central to the problem of investment.

Capital investment is thus a complex process, deeply rooted in society, and requiring examination within that context if it is to be studied effectively. It is perhaps the most positive merit of this concept that it permits no divorce between the subject and its historical, social, and economic context. However great the intellectual satisfaction to be derived from the estimation of additions to capital stock by statistical and conjectural means, the study of the financing of this process

through the assembly and analysis of historical evidence is of great importance for the understanding of the whole subject. It is therefore worthy of serious consideration.

iii Method and Evidence

The pre-occupation of some economic historians with the application of the skills of the economist rather than those of the historian to the problems of economic change, may have led to the neglect of the process of capital formation. I am not referring primarily to the adoption of the hypothetico-deductive approach, and the modelling and analytical techniques of the 'new' economic history, for in the building up of data on capital formation in Britain there is a flavour of the 'old' economic history, though with much of the material statistically rather than empirically derived. I am however suggesting that the emulation of the economists' skills of measurement at the national level, devising approximations and aggregations to overcome deficiencies of data, may account for the failure to study the procedural aspects of the subject in its historical context.

The case for concentrating on the national economy as the basic unit of research was made for economists by Kuznets on the grounds that it is the sovereign state which formulates policy and sets the institutional conditions within which

economic activities are pursued³³. However historians are not for the most part concerned with producing analyses for policy making, and there are cases where the region is a much more appropriate and 'real' unit for the investigation of economic change. This consideration, and the dangers of 'an excessively aggregative approach to the study of industrialisation', were stressed by the S.S.R.C in a report of 1971. They noted that:

'To approach certain relationships from the assumptions of a 'national economy', or to formulate generalizations which subsume piecemeal variety, is to obscure reality. With structural, sectoral, and regional change being so pronounced during the early stages of industrialization...national aggregates and averages may be more than usually misleading. Studies on a regional or sectoral basis not only of industrial growth itself, but of particular aspects of processes such as capital investment...can reveal critical relationships far more clearly than national studies'³⁴.

These warnings have been virtually ignored in the years since they were issued. The major study of capital formation initiated in Sheffield was shaped on an aggregative basis with no evident concern for the major practical problems involved, especially the loss of any evidence of variety entailed by this method, and the detachment from reality which this imposed. Nor has concern been shown about the theoretical issues implicit in the subject, such as those debated in the long-running 'Cambridge controversy' about the measurement of capital, especially the difficulties arising from its heterogeneity³⁵. It may be that these problems are not so important for studies of national statistics as for other branches of economics, or

that these estimations may be in any case best compiled by a process of 'measurement without theory'. Whatever the reason it is unacceptable that capital formation should be interpreted simply, and without justification, as an aggregative concept. Despite widespread practice aggregation is no necessary part of any recognized definition of capital formation: rather it is a chosen method which has led to the neglect of alternative approaches.

Any idea that the volume edited by Feinstein and Pollard represents a now out-dated approach to the subject will be dispelled by reference to the recent study of Regions and Industries edited by Hudson. The author introduces the first chapter with the observation that 'Disaggregated analyses of the industrial revolution in Britain are currently out of fashion'. Instead the emphasis is on calculations of the movement of aggregate variables and the fashioning of hypotheses about causal relationships, an approach which provides a limited 'perspective on industrial change and economic development', for 'aspects of economy and society which were innovative or unique to the period have been neglected'. Hudson concludes that the complexities of economic growth in the historical situation mean 'its precise impact and importance eludes the national-level quantitative methods so fashionable in the current historiography'³⁶.

It cannot of course be claimed that traditional historical research based on respect for the integrity of original sources produces 'facts' which represent an absolute truth, for they too are shaped by the perceptions of the researcher and the nature of the material under scrutiny. But at least the historian can draw conclusions in full knowledge of the varying weight to be placed on different strands of evidence. In contrast, in pursuit of aggregate figures the 'new' economic historian is frequently obliged to incorporate estimates of doubtful provenance, coming from sources and obtained by methods not susceptible to easy checks. An example may be provided from a case stated more fully elsewhere whereby figures concerning investment in the turnpike roads, compiled by Ginarlis through a process of backward extrapolation on the mistaken assumption that such roads were of a constant size throughout their life history, were incorporated by Feinstein in published estimates, so giving them an undeserved credibility³⁷.

It is ironic that in relation to his own work Feinstein lies in the tradition of pioneers who have stressed the doubtful nature of the estimations produced, warning for example of speculations, rough guesses, and arbitrary assumptions, especially before 1800. Re-working his material led to the observation that 'The substantial scale of the present revisions to earlier work should perhaps be sufficient warning of the conjectural nature of any estimates of capital formation

for the eighteenth and nineteenth centuries'. He admitted that 'In most cases the required series can only be compiled if the historian is willing to cast aside normal procedures (and inhibitions) when faced with the absence of relevant records, and turns instead to insecure guesses about possible orders of magnitude'³⁸. Despite such cautions conjectured figures may be represented as reliable evidence from which firm conclusions may be drawn.

Even more serious than the conversion of speculation into dogmatic assertion³⁹, is the maintenance of an insufficient distinction between historically and statistically derived 'facts' to be found for example in work on the ratio of investment to national income in the nineteenth century American economy. A 'dramatic increase' is claimed, but data pre-1840 is notoriously deficient on both increases in capital stock and the size of the national product⁴⁰. A study of the incestuous web of cross-references cited in support of the quantitative evidence for the earlier years of the study shows only a tenuous link with historical reality, and the reader is informed at one stage that 'We must be primarily concerned with problems of acceptable prediction rather than attempts at a thorough explanation and analysis of known events'⁴¹. Other sources which rest in inaccessible worksheets are difficult to pursue, but the general absurdity of sustaining an analytical argument about a 'dramatic increase' in investment ratios on the basis of data with such problems of accuracy and comparability

is confirmed by reference to the published works of the authors cited. These show that the past is seen as 'the social scientist's laboratory', that the 'historical analysis' ignores to a large extent 'the chronological ordering of events' and that although 'the model is crude, the information used to illustrate (test) the model is in many cases even cruder'⁴².

Such bald claims may offend 'new' economic historians in Britain by their lack of subtlety, but they are very revealing about this approach. They show that in adopting the procedures of the sciences (including economics and the social sciences), historical studies must move so far from their traditional base that they may no longer be regarded as history. The 'old' method defines the problem, evaluates sources of information, and then collects and analyses data of both a qualitative and quantitative nature about for example individuals, interest groups, and the economy, from which a concluding explanation can be drawn. In contrast the 'new' method is concerned with generalization. Individuals, events, and social and economic life are important in relation to the testing of a theory, but not in their own right. The pages of a work embodying the 'new' approach, edited by Roderick Floud and Donald McCloskey, are almost bereft of people and their culture despite the fact that amongst the most fundamental factors in growth may be the non-economic ones such as the activities of entrepreneurs⁴³. Their neglect of significant matters was grudgingly admitted in a review which acknowledged that in contrast to this work, a new

publication by Christopher Clay which attempted to relate economic to social questions, provided a focus permitting him 'to examine some largely ignored questions'⁴⁴.

The suggestion that the limitation of scope may be one indication of the fundamental unsuitability of neoclassical theory as the organizing framework for historical research was developed by Peter Temin in his consideration of 'The Future of the New Economic History' in the early 1980s. He concluded that the 'economic model of behaviour' was but one 'among several, suitable for the analysis of some but not all problems', and was hopeful that new approaches on for example the operation of firms would bring the profession into 'greater touch with the diversity of human behaviour which has been the mainstay of all history'⁴⁵. But a less optimistic conclusion was reached by Stephen Wentworth, who saw the 'cliometric program' as 'marginalizing history'. He observed that:

'The range of historical problems amenable to systematic treatment as testable hypotheses in specified neoclassical models proved to be quite limited. Many basic themes and traditional problems of economic history are thereby excluded...or at best must await promised theoretical and econometric development within the neoclassical paradigm. Such basic themes..as economic development, industrialization, structural change, technological interdependencies, the nature of the labor process, class relationships, non-market decision making, social conflicts and the social and political character of the state are precluded from meaningful systematic treatment in the cliometric approach'⁴⁶.

A British slant to this matter was provided by C.H.Lee in his report to the S.S.R.C. on Social Science and History. By

referring to six accounts of enclosure in the eighteenth century, of which half were written in the 'traditional literary style' and half employed econometrics, he raised the prospect of the complementary^{it} of such studies, but this neat facility will only rarely be available to flesh out the econometric approach, based on a highly specified but narrow model⁴⁷.

The doubts raised by the restrictiveness of the neo-classical framework and the high degree of aggregation required by its procedures, which must exclude the non-quantifiable whilst at the same time risking violence to the available information through its unwarranted or excessively speculative use, raise echoes of an earlier controversy on the neglect of historical evidence in which it was suggested that 'The worst use of theory...is to make men insensible to fact'. It would be unwise to reopen the debate between Cunningham and Marshall because the former's overstatement of his case helped to give the latter the better of the argument. Nevertheless Cunningham's judgement that the 'neglect of the patient study of actual fact' is disastrous 'because it prevents the economist from finding out the narrow limits within which his generalizations are even approximately true', is worth quoting because the criticism remains as valid today as when it was made⁴⁸. It is not however past controversies but present studies which demonstrate the need for more factual information, to supplement in general the data which has been

overstretched in the pursuit of national aggregates and the testing of hypotheses, and to ensure in particular that the concept of capital formation does not remain confined within a narrow and restrictive interpretation which fails to take into account the historical dimension of the subject.

iv Conclusion

It has now been demonstrated that there are no conceptual barriers to the study of the process of the formation of capital in a regional context, because this subject need not be pursued by definition on an aggregative basis and in a national framework. Nor are models refined according to neo-classical theory necessarily the best or even the only organizational framework for proceeding with this research. The way is thus cleared for a consideration of a more fruitful method by which to study the relationships underlying the process of capital investment.

In the following study of north Somerset the structure of the region is investigated before an attempt is made to understand the processes of capital investment taking place within it. This involves an analytical and interpretive account of the context of the region, its population and social structure, its relationship with Bristol, and the circumstances of its agriculture, manufacturing, mining, transport and trade.

Matters such as legal and financial services, and entrepreneurial and merchanting skills, receive the fullest treatment possible because of the significance of their role in the process of economic change. Through this comprehensive approach, aspects of society which are neither amenable to aggregative study nor easily incorporated into models, become elements of the framework within which change can be studied.

Within this context the focus of research is the process by which money capital was converted into real productive assets. For this purpose a continuity of evidence on investment is desirable, but this is difficult to come by as was shown by Stanley Chapman's study of cotton spinning in the east Midlands. Here a sufficient continuity of documentary evidence was found for an analysis of the financial structure of only one firm, and then for just thirteen years⁴⁹. In north Somerset this shortage of a continuity of information has been countered largely by the selection of case studies within the different sectors of the economy, for which such material can be built up. In this way it has been possible to secure evidence of the process of capital investment at the grass roots level. Conclusions drawn from the case studies have then been related as carefully as possible to the pattern of development in north Somerset, with a full awareness of the dangers inherent in such unique survivals of evidence.

Since this research is concerned essentially with charting and explaining a process it deals in the minutiae of change, assembled however not for its own sake but for the purpose of analysis and interpretation. Where possible evidence has been tabulated but its explanation takes the narrative form which was well-justified by Barry Supple in his survey of 'Old Problems and New Directions' in the early 1980s. He wrote that:

'The new techniques alone are not, in the last resort, satisfying because they do not address themselves to the foundations of historical concern - a narrative of the past as it unfolded, in its roundedness and interrelatedness. To write narrative history should not be a matter simply of telling the story of individual events, and certainly not of dispensing with systematic analyses and models. Yet, even in economic history, our best hope is to narrate and explain a particular past...(which) cannot be adequately approached without an understanding of the full and complex range of causal relationships in a real world'⁵⁰.

It is the aim of this study to investigate, analyse, and interpret capital investment, a process which was of great significance for the history and economy of both the region and the nation in the formative period under discussion.

- 1 Pat Hudson, The Genesis of Industrial Capital. A Study of the West Riding Textile Industry c.1750-1850(Cambridge, 1986), p.xv.
- 2 Robert M.Solow & Peter Temin, 'Introduction: The Inputs for Growth', in Mathias & Postan eds., The Cambridge Economic History of Europe, VII, pt.1 (Cambridge, 1978), p.27.
- 3 C.H.Feinstein, 'Capital Formation in Great Britain', in C.E.H.E., pt.1, pp.28-96.
- 4 Ibid., p.29 & n.3; Francois Crouzet ed., Capital Formation in the Industrial Revolution(1972), pp.39-64.
- 5 Lance E.Davis & Robert E.Gallman, 'Capital Formation in the United States during the Nineteenth Century', in C.E.H.E., pt.2, pp.1-69, especially p.17.
- 6 Feinstein & Pollard eds., Studies in Capital Formation(1988).
- 7 Higgins & Pollard eds., Aspects of Capital Investment in Great Britain 1750-1850: A Preliminary Survey(1971)
- 8 Feinstein, 'Capital Formation', in C.E.H.E., pt.1, p.28.
- 9 Jennifer Tann, 'Fixed Capital Formation in Steam Power, 1775-1825. A Case Study of the Boulton and Watt Engine', and Pollard, 'The Insurance Policies', both in Feinstein & Pollard, Studies in Capital Formation, pp.164-81 & 225-56.
- 10 Ginarlis & Pollard, 'Roads and Waterways', in Feinstein & Pollard eds., Studies in Capital Formation, pp.182-224; for a reply see Buchanan, 'The turnpike roads: a classic trap?', Jnl. Trans. Hist., 3rd ser.11, 2(1990), pp.66-72; J.R.Ward, The Finance of Canal Building in Eighteenth-Century England(Oxford, 1974).
- 11 B.A.Holderness, 'Agriculture 1770-1860', in Feinstein & Pollard eds., Studies in Capital Formation, pp.9-34. Holderness refers briefly to Feinstein's work, p.11, and the latter makes an equally brief reference to the former's estimates, p.270, n.11
- 12 Feinstein, 'Manufacturing', in Feinstein & Pollard eds., Studies in Capital Formation, pp.296-8.
- 13 J.R.Harris, P.L.Cottrell & B.L.Anderson, The Supply of Capital and the Economic Development of Merseyside 1690-1880, Social Science Research Council, Newsletter, 33(1977). Hereafter S.S.R.C.
- 14 A.G.Kenwood, 'Capital Investment in North Eastern England, 1800-1913'(unpub.Ph.D.thesis, Univ.of London, 1962); 'Fixed Capital Formation on Merseyside 1800-1913', Econ.Hist.Rev., 2nd ser.XXXI, 2(1978), pp.214-39; and 'Fixed Capital Formation in the Ports of the South Wales Coalfield, 1850-1913', in Colin Baber & L.J.Williams eds., Modern South Wales: Essays in Economic History(Cardiff, 1986), pp.117-27.

15 John Butt, 'Capital Formation and Enterprise in the Scottish Iron Industry 1780-1840', in John Butt & J.T.Ward eds., Scottish Themes (Edinburgh, 1976) and 'The Scottish Cotton Industry during the Industrial Revolution', in L.M.Cullen & T.C.Smout eds., Comparative Aspects of Scottish and Irish Economic and Social History (Edinburgh, 1977); Ian Donnachie, 'Sources of Capital and Capitalization in the Scottish Brewing Industry, c.1750-1830', Econ. Hist. Rev., 2nd ser. XXX, 2 (1977), pp. 269-83 and A History of the Brewing Industry in Scotland (Edinburgh, 1979); T.M.Devine, for example, The Tobacco Lords: A Study of the Tobacco Merchants of Glasgow (Edinburgh, 1975) and 'The Colonial Trades and Industrial Investment in Scotland', Econ. Hist. Rev., 2nd ser, XXIX, 1 (1976) 1-13

16 Pollard, 'A New Estimate of British Coal Production 1750-1850', Econ. Hist. Rev. 2nd ser. XXX, 2 (1980), pp. 212-35; Holderness, 'Landlord's Capital Formation in East Anglia, 1750-1870', Econ. Hist. Rev., 2nd ser. XXV, 3 (1972), pp. 434-47.

17 D.T.Jenkins, The West Riding Wool Textile Industry 1770-1835 (Edington, 1975); S.D.Chapman, 'Fixed Capital Formation in the British Cotton Industry 1770-1815', Econ. Hist. Rev., 2nd ser. XXIII 2 (1970), pp. 235-66 and 'Financial Restraints on the Growth of Firms in the Cotton Industry, 1790-1850', Econ. Hist. Rev. 2nd ser. XXXII, 1 (1979), pp. 50-69.

18 C.W.Chalklin, The Provincial Towns of Georgian England: A Study of the Building Process 1740-1820 (1974); R.S.Neale, Bath 1680-1850. A Social History (1981).

19 B.W.E.Alford, W.D. & H.O.Wills and the U.K. Tobacco Industry 1786-1965 (1973), pp. 464-71; Charles Wilson, The History of Unilever, 2 vols. (1954); W.J.Reader, I.C.I. A History (Oxford, 1970); D.C.Coleman, The British Paper Industry (Oxford, 1958) and Courtaulds (Oxford, 1969); W.E.Minchinton, The British Tinplate Industry (Oxford, 1957); Peter Mathias, The Brewing Industry (Cambridge, 1959); R.H.Campbell, Carron Company (Edinburgh, 1961); and Alan Birch, British Iron and Steel Industry (1967).

20 J.Ginswick, 'Early Australian Capital Formation 1836-1850', Bull. of Bus. Arch. Council of Aust., vol. 1, pt. 6, pp. 22-49 & pt. 7, pp. 43-9, (1959-60); with comments by R.H.Parker, pt. 8, pp. 39-42, and reply by Ginswick, pp. 43-8.

21 Lorna Weatherill, 'Capital and Credit in the Pottery Industry before 1770', Bus. Hist., XXIV, 3 (1982), pp. 243-58, especially 251-3.

22 Pat Hudson, The Genesis of Industrial Capital. A Study of the West Riding Wool Textile Industry (Cambridge, 1986), p. xvii.

23 Katrina Honeyman, 'Review of Periodical Literature', Econ. Hist. Rev., 2nd ser. XLIII, 1 (1990), p. 119; W.A.Cole, review, Econ. Hist. Rev., 2nd ser. XLII, 4 (1988), p. 601; Crouzet, 'Foreword' in Hudson, Genesis of Industrial Capital, p. xv.

24 Volumes published by the American National Bureau Economic of Research in the 1950s have provided a useful introduction to this subject, especially Problems of Capital Formation: Concepts, Measurement, and Controlling Factors (Princeton, 1957) and Capital Formation and Economic Growth (Princeton, 1955).

25 Joan Robinson, The Accumulation of Capital (1956), p.viii.

26 Simon Kuznets, 'International Differences in Capital Formation and Financing', in Nat.Bur.Econ.Res., Capital Formation and Economic Growth, pp.19-25, especially p.20.

27 J.Hibbert, 'Modern Practices and Conventions in Measuring Capital Formation in the National Accounts', in Higgins & Pollard eds., Aspects of Capital Investment, p.11.

28 Crouzet ed., Capital Formation in the Industrial Rev., p.1, n.1

29 Feinstein & Pollard, Studies in Capital Formation, pp.1-2, but the meaning was not debated in earlier works either. In 'Capital Formation in Great Britain', C.E.H.E., pt.1, p.632, n.26, Feinstein points the reader to his Domestic Capital Formation in the U.K. (1965) for a discussion of conceptual problems, but here, p.1, n.1 the student is referred on to the publications of the U.N., Central Statistical Office & Nat.Bur.Econ.Research.

30 Kuznets, Nat.Bur.Econ.Res., Commodity Flow and Capital Formation (New York, 1938), p.vii.

31 Statistical Office of the U.N., Concepts and Definitions of Capital Formation, Studies in Methods, Series F3 (New York, 1953), p.7, n.1; Central Statistical Office, National Accounts Statistics, Sources and Methods (1968), p.360.

32 Lance E.Davis, Richard A.Easterlin, Wm.N.Parker eds., Amer.Econ Growth: An Economist's Hist.of the U.S. (New York, 1972), p.280.

33 Kuznets, Nat.Bur.Econ.Res., Quantitative Economic Research: Trends and Problems (New York, 1972), pp.1-7.

34 S.S.R.C., Research in Econ.and Social History (1971), pp.10-11.

35 For a survey of the issues see G.C.Harcourt, Some Cambridge Controversies in the Theory of Capital (Cambridge, 1972).

36 Hudson, Regions and Industries, pp.5-10.

37 The case is examined in Buchanan, 'The Turnpike Roads: A Classic Trap?', Jnl.Trans.Hist., 3rd ser.11, 2(1990), pp.66-72.

38 Feinstein, 'Capital Formation in Great Britain', in C.E.H.E., pt.1, p.28; 'Capital Accumulation and the Industrial Revolution', in Roderick Floud & Donald McCloskey eds., The Economic History

of Britain(Cambridge,1981),vol.1,p.129; 'National Statistics' in Feinstein & Pollard eds.,Studies in Capital Formation,p.264.

39 Feinstein cites as an example R.M.Hartwell's restatement of the findings of Deane & Cole on the movement of the investment ratio in the eighteenth century,in 'Capital Formation in Great Britain',in C.E.H.E.,pt.1,p.90,n.1.

40 Davis & Gallman,'Capital Formation in the United States',in C.E.H.E.,pt.2,pp.1-69

41 Paul David,'Growth of Real Product in U.S.: New Evidence and Controlled Conjectures',Jnl.Econ.Hist.,27(1967),pp.151-95,p.158

42 Lance E.Davis,J.R.T.Hughes & Duncan McDougall,American Econ. Hist.:The Development of a National Economy(Illinois,1969),p.4.

43 Floud & McCloskey eds.,The Economic History of Britain since 1700(Cambridge,1981), 2 volumes.

44 Review by Lance Davis,Jnl.Interdisc.Hist.,17(1986),pp.467-70 of C.G.A.Clay,Economic Expansion and Social Change, (Cambridge, 1984),2 volumes.

45 Peter Temin,'Economic History in the 1980s,the Future of the New Economic History',Jnl.Interdisc.Hist.,12(1981),pp.179-97, especially pp.180,195-7.

46 Steven D.Wentworth,'Marginalizing History - A Critique of the Cliometric Program in Economic History',(unpub.Ph.D.thesis, Univ.of Uppsala,Sweden,1984),p.273.

47 C.H.Lee,Social Science and History. An Investigation into the Application of Theory and Quantification in British Economic and Social History(1983).

48 W.Cunningham,'Unconscious Assumptions in Economics',Journal Royal Statistical Society,LXVIII(1905),pp.715-24, esp.p.716.

49 S.D.Chapman,The Early Factory Masters(Newton Abbot,1967), pp.125-7.

50 Barry Supple,'Economic History in the 1980s,Old Problems and New Directions',Jnl.Interdisc.Hist.,12(1981),pp.199-205,especially p.205.

Part II The Context of Economic Change in North Somerset

Chapter 2 The Region of North Somerset: Settlement Patterns and
Population Change

i The Case for Regional Studies

If a study of the process of capital investment is outside the 'mainstream' approach, then so also is the idea of basing it within a region. The emphasis upon macro-economic investigations at the national level has meant that the recent major volume on capital formation in the United Kingdom edited by Feinstein and Pollard includes no reference to localities (region, county, or town) in its index, and makes scant mention in its text¹. The same can be said of the volumes edited by Floud and McCloskey, which have no reference to 'region' in the index/glossary, though over six column inches are devoted to an explanation of 'regression analysis'. Some indications of place may be found, but they contain little information for the reader about the reality of the subjects which the models seek to explain². However, a regional approach can be justified, in the case of the present study by the greater ease with which relationships underlying the process of capital investment can be pursued here than in the national context, and more generally by the opportunity thus provided to test current national generalizations. The assumptions underlying statistical series, of a uniformity amongst the regions,

especially before the early decades of the nineteenth century, remain unwarranted until tested against historical evidence.

It is encouraging that after its long eclipse by more fashionable approaches there is renewed interest in the study of the region, due in part to the fact that several new subjects can be studied more effectively at the micro- than the macro-level. Proto-industrialization is such a case³, as is the relation between the core and its periphery, which demands that the latter be studied as carefully as the former⁴. New thinking on the timing of the industrial revolution has also led to a growing emphasis on the regional basis of the economy before 1830, in the East Midlands for example⁵. For the Victorian period Lee has begun to present the 'overwhelming case for studying economic growth at regional level', and on the basis of the Census of Population he has defined three major growth types: textile; mining and metal working; and metropolitan regions. A fourth type was the slower growing rural, often peripheral, area⁶.

But economic historians with these new interests do not have to face a clean slate, for over the last few decades the study of localities has been nurtured by historians convinced of the appropriateness of this approach. The influential work of Alan Everitt has emphasised that local society is worthy of study because its sense of cultural identity is expressed in a social and economic cohesion based on roots that are different from

those of the 'community of the realm'⁷, an approach which is lifting local history from its earlier more limited focus. In agricultural history too there has been an emphasis in recent decades on regions and the farming practices within them, developed particularly by the 'Leicester School' of historians. Joan Thirsk for example has used local detail effectively to illumine the regional structure of the economy and society of early modern England⁸. In urban history too there has been a growing concern with early modern towns, their political, economic, and social structures, and their inter-relationships within the national economy⁹. The return to regional roots has come late in social history, though with the publication of the Cambridge Social History of Britain this omission is being redressed. The first volume is devoted to Regions and Communities, though sadly without reference to the south west, especially Somerset¹⁰. In business studies too the importance of the regions is becoming recognized, as shown by recent work on Bristol¹¹.

Whilst these historians of different persuasions have by their adoption of a regional approach been expressing dissatisfaction at the way studies have been confined to the national level, a similar process has been taking place amongst historical geographers. John Langton has been a leading protagonist, setting out to 'challenge the widespread belief, shared by historians and geographers, that industrialization destroyed regional distinctiveness in England as elsewhere', by

claiming that on the contrary this identity was enhanced in the early industrial economy by the regional nature of development, which was related to the patchy and disjointed network of inland transport. Only with the coming of the railways did the balance between regional separation and national integration tilt decisively in favour of the latter¹². Both Langton and Derek Gregory are critical of Pollard's volume on Peaceful Conquest: the industrialisation of Europe 1760-1970, the former regarding it as a regional study of 'a more old-fashioned kind', the latter making the more serious criticism of its emphasis on the diffusion of technical innovation at the expense of a 'geography of investment'. On entering the debate Michael Freeman expressed regret that Langton's paper would find 'no immediate audience amongst economic and social historians', but the publication of the volume edited by Hudson on Regions and Industries, should dispel such fears¹³. The value of this book lies partly in the evidence it provides of work already being carried out on the regions, and partly in the contribution it is able to make to the fundamental question of the origins and progress of industrial change, so much of which was in its early days a regional phenomenon.

ii The Region of North Somerset

Arguments in favour of the study of regional history as a way of discovering the diversity of parts within the national

whole, do not imply that localities themselves necessarily represent a homogeneous unit. This is particularly the case with counties, which may form an area of administrative convenience rather than a natural region. In the historic county of Somerset there is a range of topography and settlement which quickly becomes apparent through the comments of writers over the years, as well as by personal observation. In the first volume of the Victoria County History it was claimed that 'Few counties in England present so great a diversity of scenery as Somerset, and none possesses a greater variety of geological formations'¹⁴. In the eighteenth century these features of special interest meant that the county was studied not only by those with an interest in its history such as the Reverend John Collinson whose work provides a good general survey of the period, but also and more unusually by those intrigued by its underlying structure. John Strachey and William Smith are worthy of special mention for both were concerned with the stratification of rocks, particularly in relation to the exploitation of coal, the former in the early eighteenth century, the latter from the 1790s¹⁵.

The diversity of the county's geology has given rise to three main physical regions. These are the high lands of the west, chiefly Exmoor with its outlier the Brendon Hills, and the Quantocks; the low-lying central Levels; and the northern sector composed of the Mendip Hills and the lands falling away to the county boundary at the River Avon. In a gross over-

simplification of this complex subject it may be said that the older and higher rocks of west Somerset are composed chiefly of grits and sandstones, which are also exposed in the loftier parts of the Mendip Hills where the old red sandstones show through the limestone cover at a height of over 1,000 feet. In contrast, the Levels are moorlands of peat and alluvium¹⁶.

Of these three regions the northern third, the subject of this study, contains the most variety. The Mendip Hills are a bleak and treeless plateau of carboniferous limestone, running approximately east and west for over thirty miles at a height of about 800 to 900 feet, and reaching the coast at Brean Down near Weston-super-Mare. Further west are the 'island-remnants' of Steep Holm and Flat Holm. Between the Mendips and Bristol there are similar formations at Broadfield Down, and in the Failand Hills which run west from that city to the River Severn at Clevedon. Coal-bearing measures occur at the eastern end of Mendip, and around Nailsea. Lead and calamine were amongst the minerals exploited in the central plateau. In contrast to the sharp rise of its southern edge, the northern flank of Mendip falls away in undulating hills and valleys of agriculturally-rewarding sandy marls. In the north-east, Bath is cradled in the oolitic limestone downs at the southern end of the Cotswolds, of which Dundry Hill to the south of Bristol is a distinct and notable outlier of nearly 800 feet. Although the central Levels south of Mendip make up the largest tract of lowland at risk of flooding, parts of coastal north Somerset

were also subject to this hazard. These include the North Marsh between Clevedon and Weston-super-Mare and the Gordano Valley, both so low-lying in relation to the surrounding hills and even to the sea-coast, that they were subject to serious inundation by rivers in flood unable to empty their waters into the sea because of incoming high tides.

The northern third of the old county stretches from the southern edge of the Mendips northwards to the River Avon, and lies between the mouths of the Rivers Avon and Axe on the west coast and the towns of Bath and Frome on the east. The waters of the westward flowing Axe originate in Mendip springs at Wookey, Draycot, Cheddar and Winscombe, and reach the Bristol Channel at Uphill. In contrast, those of the river Chew flow north to join the Avon at Keynsham. The Mendips are almost bare of settlement but on the southern edge of the region are the towns of Axbridge, Cheddar, Wells, and Shepton Mallet. In a series of lower undulations and pastoral valleys sloping to the north, settlements associated with farming, textiles, mining, and manufacture are to be found ranging widely in size and location. In 1801 the region of north Somerset covered 314,484 acres and constituted 30 per cent of the old county. Its population was then 122,211 heads, comprising 44.7 per cent of the county total. In 1831 it was 188,860 heads, representing 47 per cent of the total¹⁷. The application of the term 'region' to this entity is fraught with difficulties, but the designation of north Somerset as such is not an arbitrary one for the area

has both historic credibility and economic cohesion. It was defined by John Billingsley in the 1790s in his review of the county for the Board of Agriculture¹⁸, and although it had links with both the rest of Somerset and the port of Bristol, it remained separate from each.

Bristol had become a separate county in its own right in 1373¹⁹, and for this reason and because it was for some purposes like the census returns still reckoned a part of Gloucestershire, its internal development is not included in this study. To do so would in any case have changed the balance of this study. However the relationship between Bristol and north Somerset is of great interest, for the latter was an important segment of the hinterland of the port. These links have now been formalized through the creation of the modern county of Avon, which attaches to Bristol the northern part of old Somerset and the southern part of old Gloucestershire. It comes as no surprise that the liaison can be a troublesome one, for in 1867 some members of the Somerset Archaeological and Natural History Society boycotted the annual meeting because it was held in Bristol, and so the Society was 'stepping over its borders'. The organizer responded by claiming that:

'they could not properly and completely discharge their functions, unless they took into their sphere of operations, at least for once, a city which was so closely connected with them..Some of the Bristol churches were essentially in their architecture, types of Somersetshire churches, and the Society could not complete its archaeological surveys without inspecting these churches'²⁰.

This balanced reply illustrates very well the position adopted in this thesis, that although north Somerset remains the focus of study, the survey of the process of capital investment could not be undertaken satisfactorily if the links with Bristol were excluded as a legitimate subject of research. North Somerset was part of its county in matters of civil and church administration, politics and justice, but the Mendip barrier which detached it from the traditional centres of government of Somerset, also exposed it to the growing economic power of Bristol.

To define north Somerset in terms of these relationships might seem to suggest that although it had an historical and topographical credibility, it did not constitute a recognizable economic unit. But unless it achieves an unlikely self-sufficiency any region must forge links, and here these flourished on the complementarity of north Somerset's advantages of water power and Bristol's of foreign trade. Again, if the quality of homogeneity is to be the touchstone of a region, then north Somerset is in danger of failing the test for the dominant feature of its economic development was the way different parts flourished at different times, in relation to developments in industry, agriculture, mining, and transport, and in response to the influence of Bristol and the rest of the surrounding area. However, far from constituting a disqualification for analysis such non-homogeneity has long formed one of the basic premises of modern intra-regional

studies²¹. It is true that when the geographer analyses the uneven though related distribution of economic activity and population within a region, non-homogeneity is defined in spatial terms, with reference for example to the location of hierarchies of settlement, but the concept may also be used by historians in relation to the dimension of time and the historical perspective. It is indeed the non-homogeneity of change in this marginal part of the country, on the western seaboard and so able to share the world-wide and varied trading patterns of its neighbour Bristol, which makes north Somerset such a promising region to study.

iii Settlement Patterns and Population Change

By the mid-eighteenth century Somerset had long been regarded as a rich and populous county. In north Somerset this wealth was based upon agricultural produce; the manufacture of woollen cloth, brass and copper goods, and gunpowder; the extraction of lead, calamine, stone, and coal; and the flow of visitors to Bath, premier city if not county town. Defoe had observed the flourishing condition of agriculture in the 1720s, and the 'increasing and visible circumstance' of the clothing trade. Lead mining had by then passed its peak, but its importance had been noted earlier by Camden who had also observed the presence of calamine in 'plenty'²². Much of the pattern of settlement which supported this economic activity

was established before the Norman Conquest, though the earliest evidence of human life in this region came from the two areas which were little inhabited in the early eighteenth century. These were the Mendips, which had housed some of the earliest settlers in the country in pre-historic times in caves like Wookey Hole; and the Levels where frequent flooding made later habitation difficult, although the wooden trackways linking islands of new Stone Age settlement are amongst the oldest known roads in the world²³.

Early developments of the economy are indicated by monuments of the Bronze Age on Mendip, and by Iron Age forts associated with transhumance as lowland villagers pastured sheep on the uplands. Lead mining was well established by Roman times as this, and the prospect of silver, attracted their attention soon after the invasion of Britain in A.D.43. The agricultural estates clustered mainly round Bath, whose hot springs inspired the urban centre there, give a further indication of the potential of the region which the Romans were quick to exploit, building a military and commercial highroad, the Fosse Way to improve accessibility. The continuing unsuitability of the Mendips and Levels confirmed a preference for settlement in the more favourable lands of north Somerset, where the Saxons were established from the end of the sixth century, their charters revealing settlements in valley clearings. Although much of the land was common wood or pasture, the existence of common arable land is confirmed by laws of the late seventh century

invoking penalties on farmers who failed to fence their share. Villages were surrounded by woodlands, some of which climbed the scarp of Mendip and other high grounds. There were Royal Forests at Axbridge on western Mendip and Selwood on the eastern border. The watery lowlands provided fish and fowl, and the bleak plateaus offered rough grazing. On farming practice, the charters show for example that at Wrington in 902 a boundary ran by the 'wynter acres', probably of winter-sown wheat and rye. Flax is mentioned at Pilton, and at Weston near Bath there was a dairy farm and cattle-shed in 946. There were deer here, rabbits at Marksbury and game enclosures at Mells and Bathampton, as well as quarries at North Stoke, a sandpit at Compton Bishop, and a landing place at North Wootton²⁴.

A number of non-agricultural centres also began to gain or regain importance during this period, although in general towns such as Frome were few and small in number. In 676 a convent was founded at Bath, and a mint was established there and at Axbridge, both towns being listed among the fortified 'burhs' in the Burghal Hidage of c.910²⁵. The comparatively late growth of Bristol began in this period, with the development of its cloth and trading interests. A reference in early laws to the operation of a slave trade from the port gives a preview of what was later to become a major source of wealth to both that city and north Somerset²⁶. The pattern of settlement was thus almost fully established in this region before the great Domesday Survey of 1086. It was to be adjusted later only as

agricultural fortunes fluctuated, cloth-making, mining and manufacture ebbed and flowed, and leisure preferences changed from spa to coast²⁷.

The Domesday Survey does more than confirm this outline of north Somerset's development by the eleventh century, it also provides some basis for speculation about population numbers and values per acre. In both these respects the eastern part of the region ranked most highly, followed by the lands north of Mendip to the Avon, with the Mendips and coastal Levels coming last. From the Domesday evidence it has been suggested that after adjustments have been made for those not included in the Survey (women, children, the old, landowners, churchmen, and borough dwellers other than burgesses), the population of Somerset may then have been between 88,000 and 93,000²⁸. This would have been about one-third of that recorded at the first census of 1801, before which of course all estimations are very risky. Bath was the largest of the Domesday boroughs in the county, with 192 recorded burgesses. Its population may have been between 2,000 and 3,000 if allowance is made for the unrecorded. The 32 burgesses of Axbridge may have provided the base for a population of 400 to 500 persons. Frome was regarded as a borough but had no recorded burgesses, and despite its ecclesiastical connections Wells remained a village. Of the settlements mentioned in Saxon charters but omitted from the Domesday Survey (perhaps because recorded under larger units), Binegar, Dinder, and Wookey all had a later economic importance.

Estimates in the Victoria County History suggest that at the time of the Survey only six counties in England were more densely peopled. In terms of comparative wealth however Somerset was not so well-favoured, though its rank as twelfth county may reflect the fact that many of its assets had not then been realised. In particular the potentially rich Levels were either ignored or, like the low moors at Wedmore, described as having no value²⁹. Under the pressure of rising population in the thirteenth century however the drainage of these wetlands began. Land was reclaimed from the sea, as at Portbury on the northern coastal plains, or from the large river systems like the Axe. Walls and ditches were built and watercourses improved, especially by great ecclesiastical landowners such as the Bishop of Bath and Wells. In the upland wastes there was reclamation from the woods on the northern slopes of Mendip, as at East and West Harptree, and from those on the southern edge as at Cheddar. Inroads were made at Selwood Forest on the eastern border by settlers from Frome³⁰.

This expansion was halted in the early decades of the fourteenth century by the problems of harvest failure and disease which culminated in the Black Death of 1348. The ensuing mortality is difficult to estimate but one-third of the inhabitants may have died. This check had a significant effect on the economy of the region, for as corn crops retreated from the margins of cultivation and the land was converted to grass, so sheep became increasingly important. Mendip became a great

sheep walk, especially for the flocks of Glastonbury Abbey which grazed on its manors of Doultong, Wrington, Marksbury, Mells, Batcombe, and Pilton. By the end of the fourteenth century the county was leading all others in the number of woollen cloths produced, and most were made in north Somerset at centres such as Bath, Frome, Shepton Mallet, Beckington, and Pensford. By the middle of the following century there was also a thriving trade in the export of wool, particularly to Italy and Flanders³¹. This growing wealth led to the building of splendid churches as at Chewton Mendip. Less impressionistic evidence may be culled from tax assessments. An analysis of those for 1334 and 1515 shows that in terms of both lay and clerical wealth per acre, Somerset was twenty-third out of thirty counties in 1334 (when high assessments were associated with wheat growing), but rose to become second in 1515 (when wealth was associated with other commodities such as cloth and wool)³². A similar comparison of the relative positions in 1524/5 and the 1670s shows that for the county in general and north Somerset in particular there was over this period a marked increase in the share of both taxable wealth and taxable population, perhaps explained for this region by the growth of mining on Mendip and the prosperity brought to farming by the rapid growth of Bristol in the late seventeenth century³³. At the Ship Money assessments of 1635-37, only Devon, Yorkshire, and London were rated more highly³⁴.

Figures assembled by Phyllis Deane and W.A.Cole show that at the beginning of the eighteenth century Somerset was one of six English counties with more than 200,000 inhabitants. By mid-century its then total of 214,096 had risen to 222,526, and the county was ranked fifth. With a population of 282,487 in 1801, Somerset came sixth. The numbers had increased to 408,702 by 1831, but its mixed economy was being outstripped by the industrial and commercial counties of the north and midlands, and it had slipped to eighth³⁵. In an attempt to improve on these totals Stephen Pole has suggested an estimated population of 186,660 in 1700 rising to 259,920 in 1801³⁶ giving the greater rate of increase in Somerset's population in the eighteenth century of 39 per cent, and not 32 per cent as Deane and Cole's figures suggest, so the later decline may have been all the greater.

It has been noted that towards the end of the eleventh century there were possibly only six counties more densely populated than Somerset. In the later sixteenth century it was reckoned to lie third or fourth, rising on E.K.C.Gonner's calculations to rank second relative to other counties in 1700. But by 1750 it was fourth, and by 1801 it was ninth, or perhaps even twelfth according to Pole. This decline in rank accords with estimations of migration and natural increase which show that despite Somerset's doubling of population between 1700 and 1831 there was a continuing net loss by migration, particularly during the three decades after 1751. Much of this wastage was

into or through Bristol, for the city was not only a rapidly growing industrial centre drawing labour from other counties, it was also a port from which free and indentured men embarked for the colonies³⁷.

Revealing though they are, none of these generalizations can indicate with any precision the timing of the acceleration of population growth. However, Stephen Jackson's detailed study of some parish records for north east Somerset shows it to have occurred there in the middle decades of the eighteenth century. Jackson notes a 'marked acceleration in the rate of increase... between 1745 and 1765', initiating steady growth until the mid-1780s. The rate of expansion was then 'relatively rapid' until the end of the century. Jackson relates these features to changing patterns of mortality as epidemics declined. He notes that 'the general trends in fertility in this area seem to have been of lesser importance', although 'in some parishes at least, there were very marked increases in fertility during the second half of the century'³⁸. As the area studied includes agricultural as well as cloth making and mining parishes, it may be that these results can be applied more widely to the rest of the region. But in seeking trends through Spectral, Cluster and Factor Analysis, and Symapping, Jackson's methods conspire to frustrate the reader by locking away rather than revealing specific information about particular parishes.

For the early 1790s this deficiency can be partly remedied by reference to the population and housing figures for some seventy parishes in north Somerset, collected and published by Collinson³⁹. From this evidence it has been possible to calculate that the average number of persons per dwelling was then 5.4. Most crowded were the six clothing parishes to the south east, around Shepton Mallet, with an average of 5.9 per house. Least crowded, and averaging 5.0 per house, were seven largely agricultural parishes to the south and north west of Bristol, from which labourers may have been drawn away to work in that city. In the thirteen parishes around Bath the average was 5.5 per house, whilst in the single example for which this evidence is available between Bath and Bristol, the figure is 5.25. In all the other groups, based on the Mendips but shading into the Levels in the west (19 parishes), into the mining and clothing villages in the east (10 parishes), and north to the undulating farmlands (9 parishes), the average is that of the whole area, 5.4. Although limited in its coverage, Collinson's evidence provides an invaluable introduction to the more comprehensive material in the Census Returns of the following decades. The distribution and density of population in the first thirty years of the nineteenth century can thus be compared with that for a number of parishes in the early 1790s, as well as with the general understanding of settlement patterns in the region.

The Census Returns confirm first of all the importance of this region within the county, for although the population of Somerset increased by 47 per cent between 1801 and 1831, that of north Somerset rose by 54.5 per cent⁴⁰. The greatest increase was in Bedminster, where there was a three-fold growth of population in the parish which was to become a suburb of Bristol. Similarly with those which became part of Bath, though here the increase was the less dramatic average of 144 per cent. Collinson's account of one of these however, Bathwick, places this evidence in perspective, for although numbers rose by less than 50 per cent between 1801 and 1831, there had already been an eleven-fold increase in the previous decade, probably due to the development of the Pulteney Estate between 1788 and 1792. The expansion of Bristol and Bath into nearby parishes was in the early nineteenth century at the expense of their old core of parishes, whose population in the case of Bath rose only 37.5 per cent between 1801 and 1831.

The clothing towns of Frome and Shepton Mallet showed a similar lack of vitality in these years, with rates of increase of 40 per cent and the very low 4.4 per cent respectively. In case there was here too the compensation of suburban growth, the population of adjoining parishes has also been calculated, but the resulting increases of 12.6 per cent and 20.6 per cent respectively show this was not so. Nor had later growth been forestalled by developments in the 1790s, for in Frome there was then a modest increase of 7.9 per cent, whilst Collinson's

figures for Shepton Mallet suggest a dramatic drop of over 40 per cent in that decade. On the southern edge of Mendip the growth of Axbridge was similarly restrained, with a rise of 21.8 per cent between 1801 and 1831 doing little more than compensate for a loss of 18 per cent in the 1790s, whilst it is likely that the higher rate of increase at Wells of 47.95 per cent between 1801 and 1831 was ensured by its ecclesiastical rather than clothing importance. Other previously flourishing centres of the cloth industry like Beckington and Nunney underwent a long decline in the nineteenth century, although the population of the former had risen by an estimated 43.6 per cent in the 1790s.

The growing importance of coalmining between 1801 and 1831, and the late start of the major centres, are reflected in the rates of growth in those years of Radstock (128.8 per cent) and Camerton (123.2 per cent). Collinson's figures allow Timsbury's lower growth at this time (91.45 per cent) to be put into perspective, for it followed an increase of 185.6 per cent in the 1790s, probably associated with the sinking of the first pits on the outskirts of the village in 1791. These mining centres were all set in mixed rural economies, where despite the continuing importance of agriculture, small-scale mining, and manufacture, the rate of population growth (as measured by the Hundreds minus the mining towns) was on average the modest 25.5 per cent. In the Hundred of Keynsham too, where as will be seen there were a number of manufacturing concerns on rural

sites making especially copper and brass, the average increase was the similarly low rate of 33.6 per cent. In the Liberty of Mells and Leigh-on-Mendip where Fussell's iron works were making a substantial contribution to the economy of north Somerset, the population rose by only 15.3 per cent between 1801 and 1831. It was thus not only the declining clothmaking industry but other still-flourishing forms of manufacture which seemed to have little impact on the rural communities in which they operated. The 1801 Census Return of eighty persons in the parish of Woolley where from the 1720s farming had co-existed with a successful gunpowder works, confirms that the forms of manufacture practised in north Somerset did not greatly swell the rural population.

Of the two areas previously little inhabited, the Mendip parishes showed an average population increase of 40 per cent in the first three decades of the nineteenth century, as the enclosed uplands were settled and farmed. At East Harptree for example, population grew at 48.8 per cent following a rise of only 11.2 per cent in the 1790s, and at Rowberrow an increase of 57.4 per cent replaced a fall of 17 per cent. The importance of renewed activity at the old Mendip lead works is shown by the increase of 70 per cent between 1801 and 1831 at Priddy, the only village on the plateau. Large scale drainage schemes in the northern Levels permitted farming and settlement on previously water-logged lands. At Weston-in-Gordano for example, where major drainage was undertaken between 1810 and

1815, the population fall of 40 per cent in the 1790s was corrected by a rise of 37.8 per cent by 1831. The growing accessibility of the coast near Bristol began to convert fishing villages into resorts. At Weston-super-Mare a fall of 1.4 per cent in the 1790s was followed by an almost ten-fold growth of population between 1801 and 1831. In those thirty years Clevedon grew by three and a half times, and the population of Portishead more than doubled. In the same period the glass making and coal mining parish of Nailsea almost doubled in size. Excluding these last four special cases the rise in population in the northern Levels was the same as the Mendip parishes, about 40 per cent. For agricultural parishes nearer the food market of Bristol, such as Backwell and Winford, the average rate of growth was the higher 54 per cent.

The growth of population in north Somerset by more than 50 per cent over the years 1801 to 1831, with the highest concentration in suburban, mining, and some manufacturing parishes, was a matter of concern to the county magistrates. The Commissions of the Peace will be examined later as a source of evidence on social structure, but it is appropriate to consider here some of the correspondence expressing a wish for more justices, which arose from fears about population growth. Most of the surviving letters are from the 1820s and they focus on the need for more resident magistrates, at Batheaston for example to keep 'the lower orders in good behaviour', and at Freshford to maintain order in a parish of 600 persons, several

factories and two public houses. But in general population pressures in parishes near Bath do not seem to have been felt so strongly as in those near Bristol. In 1820 for example the Justice's Clerk for Bristol wrote to his Somerset colleague about the need for more magistrates in the populous Divisions of Hartcliffe, Bedminster, and Portbury, where three of the parishes (Bedminster, Nailsea, and St.Georges) totalled nearly 15,000 people. In 1822 the case of Bedminster with its almost 8,000 people was presented again, and in response two names from the parish were in 1824 added to the Commission by Cold Seal. In the mid-1820s the growing problems of the Keynsham Division led to pressure on an unwilling clergyman to allow his name to go forward, despite the decline in the status of the magistracy likely to result from his plea that with a large family and a small house he had 'not the least room to receive common people on business'. The help of resident clergymen was also sought in 1825 to relieve the problems of the parish of St.Georges or Easton-in-Gordano, which included the piloting haven of Pill. Here the difficulties presented by a population of 3,000 with access to fourteen public houses were exacerbated by the fact that the many seafarers could escape punishment by taking to the Bristol Channel ⁴¹.

iv Conclusion

It has been argued in this survey that north Somerset constitutes a region worthy of study in its own right by reason of its geographical features, historical circumstance, and economic cohesion. From the days of its early settlement the features which were to help shape its future development were already in place, namely its agricultural advantages, mineral reserves, and proximity to a great port. By the mid-eighteenth century it was the most important third of a rich and populous county, and was thus well-placed to take part in the changes characterized as the industrial revolution. Its growing population was employed in agriculture, mining, small-scale manufacture, and urban occupations. This pattern was modified in response to changing economic circumstances, especially those relating to the decline of the cloth industry, the growth of coalmining, the changing fortunes of trade, and the development of Bristol and Bath whose influence spread into surrounding parishes. Upland enclosure and lowland drainage opened up new areas for farming and habitation and led to significant changes in the old settlement patterns. The capital investment underlying these changes will be investigated later, as will be the likely reasons for the failure of the economy of the region to develop in the way its background and advantages would seem to suggest.

- 1 Feinstein & Pollard eds., Studies in Capital Formation. Some authors show a stronger sense of place than others. In Pollard's chapter on 'Insurance Policies' for example, regional location is one of the bases of classification, and in that on 'Coal Mining, 1750-1850', the footnotes provide local references.
- 2 Floud & McCloskey eds., Economic History of Britain.
- 3 Hudson, 'Proto-industrialisation', ReFresh, 10(1990), summarizes current thinking and provides an up-to-date bibliography.
- 4 Ivan T. Berend & Gyorgy Ranki, The European Periphery and Industrialization 1780-1914 (Cambridge, 1982); Patrick O'Brien, 'European Economic Development: The Contribution of the Periphery', Econ. Hist. Rev., 2nd ser. XXXV, 1(1982), pp. 1-18.
- 5 J.V. Beckett & J.E. Heath, 'When was the Industrial Revolution in the East Midlands?', Midland Hist., XIII(1988), pp. 77-94.
- 6 C.H. Lee, 'Regional Growth and Structural Change in Victorian Britain', Econ. Hist. Rev., 2nd ser. XXXIV, 3(1981), pp. 438-52. For the development of a peripheral country see Kristine Bruland, British Technology and European Industrialization: The Norwegian Textile Industry in the Mid Nineteenth Century (Cambridge, 1989).
- 7 Alan Everitt, 'Country, County and Town: Patterns of Regional Evolution in England', Trans. Roy. Hist. Soc., 29(1979), pp. 79-108.
- 8 J. Thirsk, The Rural Economy of England (Hambledon Press, 1984).
- 9 Peter Clark ed., The Transformation of English Provincial Towns 1600-1800 (1984).
- 10 F.M.L. Thompson ed., The Cambridge Social History of Britain 1750-1950 (Cambridge, 1990), 3 vols., Vol. I, Regions and Communities.
- 11 Charles E. Harvey & Jon Press, Studies in the Business History of Bristol (Bristol, 1988).
- 12 John Langton, 'Industrial revolution and the regional geography of England', Trans. Inst. Brit. Geogs., 9, 2(1984), pp. 145-67.
- 13 Ibid., p. 165, n. 5; Derek Gregory, 'The production of regions in England's industrial revolution', Jnl. Hist. Geog., 14, 1(1988), pp. 50-8; Pollard, Peaceful Conquest: the industrialization of Europe 1760-1970 (1981); Michael Freeman, 'Industrial revolution and the regional geography of England: a comment', Trans. Inst. Brit. Geogs., 9, 2(1984), pp. 507-12; Hudson ed., Regions and Industries (Cambridge, 1989).
- 14 V.C.H. Somerset (1906), I, p. 1.

- 15 John Collinson, The History and Antiquities of the County of Somerset (Bath, 1791), 3 vols. & supplement (Taunton, 1898). Strachey was admitted F.R.S 1719, and wrote in the Philosophical Transactions on geological stratification and coal mining. A brief memoir of Smith was published by Bath Libraries (1969).
- 16 Frank Walker, The Bristol Region (1972), pp. 1-90.
- 17 V.C.H. Somerset, II, App. II, Table of Population, 1801-1901.
- 18 John Billingsley, General View of the Agriculture of the County of Somerset, 1795 (Bath, 1797 edn.), p. 16.
- 19 Bryan Little, The City and County of Bristol (1954), pp. 1, 72-3.
- 20 Proc. Som. Arch. & Nat. Hist. Soc. for 1867, XIV (1869), pp. 6-7.
- 21 H.W. Richardson, Elements of Regional Economics (1969), pp. 67-9.
- 22 William Camden, Britannia (3rd edn. 1753, 2 vols. ed. Edmund Gibson), I, pp. 67-99; Daniel Defoe, A Tour Through England and Wales (1927 edn., 2 vols. ed. G.D.H. Cole), I, pp. 270-9 & II, pp. 33-9.
- 23 Michael Havinden, Somerset Landscape (1981); B.J.H. Brown 'Survey of the Development of the Leisure Industries of the Bristol Region' (unpub. Ph.D. thesis, Univ. of Bath, 1971), pp. 81-2.
- 24 Robert Dunning, History of Somerset (Bridgwater, 1978), pp. 8-11, and his History of Somerset (Chichester, 1983); Havinden, Somerset Landscape, pp. 59-67, 85-92. All examples are from north Somerset.
- 25 Havinden, Somerset Landscape, pp. 95-6, 217.
- 26 V.C.H. Somerset, II, p. 268.
- 27 Brown, 'Bristol Region', p. 85.
- 28 Havinden, Somerset Landscape, pp. 96-101.
- 29 V.C.H. Somerset, II, pp. 268-9.
- 30 Havinden, Somerset Landscape, pp. 108-112; Dunning, Somerset (1978), p. 14; F. Neale, 'Saxon and Medieval Landscapes', in Robin Atthill ed., Mendip, A New Study (1976), pp. 75-101; Michael Williams The Draining of the Somerset Levels (1970), pp. 38-81.
- 31 V.C.H. Somerset, II, pp. 290-92; Havinden, Somerset Landscape, p. 121; R.A. Pelham, 'Fourteenth-Century England', in H.C. Darby ed., Hist. Geography of England before AD 1800 (Cambridge, 1936), p. 250.
- 32 R.S. Schofield, 'The Geographical Distrib. of Wealth in England 1334-1649', Econ. Hist. Rev., 2nd ser. XVIII, 3 (1965), pp. 345-59.

33 Chris Husbands, 'Regional Change in a Pre-industrial Economy: wealth and population in England in the sixteenth and seventeenth centuries', Jnl.Hist.Geog., 13, 4 (1987), pp. 345-59.

34 Thomas Garden Barnes, Somerset 1625-1640 (1961), p. 3.

35 Phyllis Deane & W.A. Cole, British Economic Growth 1688-1959 (Cambridge, 2nd edn. 1967), p. 103, tab. 24; also E.A. Wrigley & R.S. Schofield, The Population History of Eng., 1541-1871 (1980), p. 126, n. 29, who write that at Farleigh Hungerford the rector 'noted in his register in 1811 that the census return for the parish was erroneous because the two parish officers concerned had "increased the number of persons for the sake of a trifling emolument to themselves, which accounts for the apparent increase"'.

36 Stephen Pole, 'Crime, Society, and Law Enforcement in Hanoverian Somerset' (unpub. Ph.D. thesis, Univ. of Cambridge, 1983), p. 1.

37 Barnes, Somerset, p. 2, based on the enumeration of able-bodied men in the 1588 militia statistics; E.K.C. Gonner, 'Population of Eng. in the Eighteenth Century', Jnl. Roy. Stat. Soc., LXXVI (1913), pp. 261-96; Pole, 'Crime, Society, and Law', p. 2; Deane & Cole, Brit. Econ. Growth, pp. 108-09, Tab. 25.

38 Stephen Jackson, 'Population and Change: A Study of the Spatial Variations in Population Growth in North East Somerset and West Wiltshire, 1701-1800' (unpub. Ph.D. thesis, Univ. of Liverpool, 1979), pp. 204, 317-9.

39 Collinson, History of Somerset. Details cover 43% of parishes.

40 V.C.H. Somerset, II, App. II, 'Table of Population, 1801 to 1901' pp. 338-51. The following calculations are based on this evidence compared where possible to that of Collinson for the 1790s. In 1801 Bath's population was about 30,000 and Bristol's roughly double that. It has been noted that these Returns showed that about a quarter of Gloucestershire's population then lived in Bristol, Deane & Cole, Brit. Econ. Growth, p. 132, n. 3.

41 SRO, Q/JCp2/14, letter from Mr. Chadwick of Long Ashton near Bristol, Clerk to the Justices of that city, to Edward Cole, Clerk to the Justices of the county of Somerset, 7 Feb. 1820; Q/JCp3/4, letter from Mr. R. Hart Davis to the Marquis of Bath at Longleat, Custos for Somerset, 22 Nov. 1822; Q/JCp3/7a, letter from Sir John Palmer Acland in Bath, former Chairman of the Somerset Justices to Edward Cole, 2 Sept. 1823; Q/JCp4/1, letter from the Rector and principal inhabitants of Freshford to the Marquis of Bath, 5 March 1824.

Chapter 3 The Social Structure and Stability of North Somerset

An analysis of the social structure and stability of north Somerset is particularly relevant to the study of investment, since it has a bearing on both the capacity of society to respond to economic stimuli and the sources of capital. A more detailed classification is outlined later (p.291), but as a starting point a simple distinction may be made between 'gentlemen' of wealth able to sustain themselves without labour, composed of the nobility and landed and urban gentry; those of 'middling status' including the wealthy farmers in the countryside and the merchants, tradesmen, and professionals in the towns; and the 'lower orders', sustained by their own labour but subject always to the threat of unemployment and poverty. Although much depends on the system of classification adopted, it may be said that the first group was the smallest and most select at probably less than 2 per cent of the whole in this period, whilst the last was the largest, rising on Stephen Pole's estimate in his study of crime and society, from under 50 per cent in Somerset in the mid-eighteenth century to nearly 70 per cent at its end¹. The size of the middle group may be judged in relation to the other two.

None of the histories of Somerset contains a comprehensive account of the social structure of the county, so information on this matter has had to be sought from sources not hitherto used for this purpose. In particular material has been gathered

from the fourteen Commissions of the Peace for Somerset for the period from the middle decades of the eighteenth century until 1830². These contain nearly 4,500 names which, from their cumulative nature, have been reduced to a register of about 1,500. Less than 40 per cent of those named took the qualifying oath, and the level of subsequent activity then varied greatly³. For the present purpose however the degree of participation is immaterial, as the aim of the register is to discover the men of substance in the county, those able to meet a strict and jealously guarded property qualification who would thus have had the means to contribute to the development of the economy in this period⁴. This chronological coverage has been supplemented by material from the county history published by Collinson in the mid-1790s and amended by Richard Locke some fifteen years later. These volumes intersect with the chronological sequence at the vital period around the turn of the century, and provide detailed information which establishes the past history of individuals and their families on the basis of landownership within the parishes⁵.

This evidence might seem to provide a deficient base, but a determined probing of the material allows much more to be revealed than is at first apparent. Although presented as a long recital of names, each Commission was in fact composed of two parts, an honorary list of national dignitaries, and an effective list of Somerset worthies. The former included royal dukes, Privy Councillors, law officers, and premier bishops,

inserted under the Lord Chancellor's Fiat. These were common to all counties, but a reminder to the Somerset Clerk of the Peace from the Lord Chancellor's office in 1820, that the list to be submitted should include 'such peers and persons of rank as are of the county', shows the importance attached to the territorial base of these dignitaries⁶. Including younger sons, about twenty such persons are usually to be found listed, a number which changed so little over the years that it may show some decline in Somerset's standing, for as the honorary list grew in the period studied from under 100 to more than 200, so the relative importance of the county contingent within it declined. A few of the active justices were dignitaries, but most came from the effective part of the list. They included: baronets; gentry; senior professional men (doctors of medicine, lawyers, churchmen, and serving and retired officers); and increasingly, parish clergy.

Despite the attractions of Somerset only one noble family resided on large estates there. These were the Pouletts of Hinton St. George near Crewkerne in the south of the county, and they had held this solitary eminence since being created baron in 1627⁷. On a national scale their landed interests were not great, but they had proved adept at making rewarding marriages and had moved from simple beginnings in Pawlet near Bridgwater, first to Ken Court in the northwest of the county (where land was held in the parishes of Kenn, Yatton, and Walton-in-Gordano) and then to their main seat at Hinton. Royal service was

rewarded by an earldom in 1706⁸, but thereafter the Pouletts chose to discharge their duties in Somerset rather than London. After succeeding to the title in 1743 the second Earl became Lord Lieutenant of Somerset and Custos Rotularum, fulfilling this dual role of supervising the militia and acting as principal justice of the peace for twenty years from 1744 to 1764. Between 1792 and 1819 these offices were held for twenty seven years by his descendant, the fourth Earl Poulett⁹.

The pride of long-established rank and place felt by such a family can be seen in a letter from the second Earl Poulett to the Lord Chancellor a few months before the Commission of 1749 was issued. William Pulteney, who had been created Earl of Bath only five years earlier, and whose estates in north Somerset (in Bathwick, Burrington, Wrington, and Ubley) had been purchased as recently as 1726, was now urging the speedy issue of a new Commission as there was 'such a want of Justices of the Peace in these parts of the County of Somerset where my estates lie'. Lord Poulett affected to find this the panic talk of an arriviste, commenting that 'I find nobody very impatient about it, but my Lord Bath who is but a newcomer and hardly an Inhabitant here'¹⁰.

Between the stints undertaken by the Pouletts there were two office holders whose county credentials were based on the lottery of distant kinship and marriage, and whose names therefore reveal the lack of eminent resident peers of whom the most

notable absentees were the Seymours, Dukes of Somerset. Their wayward family history may have ruled them out of consideration and they made their home at Monkton Farleigh in Wiltshire, playing little part in the life of the county sharing their name. However between 1764 and 1774 the Earl of Thomond held office. Born a Wyndham of that old county family, he had inherited an Irish peerage through remote kinship and distant marriage. His successor as Lord Lieutenant and Custos in the years 1774 to 1792 was Frederick Lord North, second Earl of Guildford and Tory Prime Minister, whose links with Somerset were forged by his marriage in 1756 to the heiress Anne Speke of Dillington House. She had inherited this estate in 1753 on the death of her father, a landowner of wealth and influence, who had been active in county politics for nearly half a century, sitting most recently for the borough of Wells between 1735 and 1747. The landed base he had built up did not however survive intact the change of ownership for the influence of the estate was diminished by sales such as that of the manor of Ashill to Robert Bryant of Ilminster, who long served as clerk of the peace for the county until his death in 1804. This suggests that although an illustrious marriage may bring a distinguished newcomer into a county community, the estates thus acquired were likely to be sold if they remained marginal to the interests of the new owner¹¹. The last office holder for the period under review was Thomas Thynne, second Marquis of Bath, who held office from 1819 to 1837 despite living at Longleat in Wiltshire. However he had lands in north Somerset,

around Frome in the east and Backwell and Cheddar in the west of the region, and so his residence outside the county was overlooked as it had been earlier for an ancestor permitted to live at Longleat whilst sheriff, 1629-30¹².

This survey does not exhaust the list of peers with lands in Somerset, but none of these upsets the generalization that the Pouletts were the only substantial resident peers. Perhaps the most notable non-resident in the early eighteenth century was the Duke of Chandos who undertook industrial developments in Bridgwater and housing schemes in Bath. His estates in north Somerset were very varied, encompassing for example: Twerton, soon to become a suburb of Bath; Saltford, an industrial centre on the Avon Navigation between Bath and Bristol; and the farming parishes of Compton Martin and Rodney Stoke on the northern and southern flanks of Mendip respectively. These properties had come to the Brydges in the mid-seventeenth century by marriage to a co-heiress of the Rodneys, five of whose sons had died without issue. After this demographic disaster which deprived Somerset of one of its richest families, the Chandos' were themselves reduced to one heiress, who in 1796 married the Marquess of Buckingham. In 1799 he was created Earl Temple of Stowe and this title passed by the female line to a daughter who married William Gore Langton esq. of Newton Park near Bath. An element of the Rodney inheritance thus came to be associated once more with north Somerset, and with a family active in its political and economic life¹³.

In the period under review there were three notable non-residents who were important to the economy of north Somerset, for what they took out rather than what they put in to it. The Earls Waldegrave who possessed the lead-rich manor of Chewton and the coal mining parish of Radstock had been granted their main estate in the mid-sixteenth century, and acquired others by purchase and marriage, but apart from a brief period in the 1820s when the Hon. William lived at Harptree Court (and was an active justice, qualifying in 1822), no member of the family lived in the region until the ninth Earl took up residence at Chewton Priory in 1898¹⁴. On a lesser scale there was a steady leaching away of coal mining profits from north Somerset through the ownership of the manor of Clutton by the Earls of Warwick, a property which had probably come to them through an early eighteenth century marriage of the then Lord Brooke to a daughter of the Thynnes¹⁵. But the biggest diversion of property and income away from the county came with the annexation by the Crown of the lands of the Gournays following an attainder for participation in the murder of Edward II. These estates were chiefly in north Somerset, and were controlled by the Duchy of Cornwall for the Prince of Wales, perhaps the greatest of the absentee landlords¹⁶.

It seems fair to conclude that in these years there was in Somerset little exercise of that strong leadership of an economic and political character by the peerage or nobility to be found in some other counties¹⁷. This was especially true of

north Somerset for the Pouletts who came closest to fulfilling this role lived in the south of the county. The neighbouring county of Gloucestershire in contrast (with whom north Somerset shared a common river boundary and interest in Bristol), was dominated by three great families, the Berkeleys, Beauforts, and Bathursts, whose powers were underpinned strongly by the influence of others such as the Ducies and the Tracies¹⁸. These families set the agenda for life in the county in a way which was unknown in Somerset, where influence was therefore necessarily dispersed amongst a large and active body of gentlemen of lesser status.

In order to discover more about these men and their place in the social structure of Somerset it is necessary to look at the effective parts of the Commissions of the Peace, where numbers rose from almost 200 in 1749 to over 300 in 1830, though with a sharp fluctuation upwards to about 500 in the first two difficult decades of the nineteenth century. Within these totals the arrangement of names shows a strong sense of status. Baronets always came first, followed by knights. Together these made about 6.5 per cent of the whole in 1749 as in 1830, though this proportion dropped to 4 per cent at the turn of the century. Doctors of divinity, law, and medicine, usually followed, rising from 1.5 per cent of the whole in 1749 to 5.6 per cent in 1814 before falling to 4.5 per cent in 1830. Esquires came next, the gentry, providing the bulk of the names. But though numbers rose from 175 in 1749 to 206 in 1830,

their proportion within the Commissions fell steadily over that time from nearly 90 per cent to just over 60 per cent.

Compensation came from the clergy, placed last in order of precedence in all the lists but rising in proportion from 4 per cent to 27 per cent.

Within each separate group there was the same sense of status. Until 1775 new names were added to the end of each section so the lists showed length of standing in the community, but were an alphabetical jungle. Then the names of the gentry and clergy were subdivided by letter, but the order of seniority was still observed within each, so that for example when John Acland joined four other members of his family on the Bench his name appeared at the end of the 'A's, with other newcomers. It was common for the gentry to serve alongside relatives in this way. Fathers or uncles would write letters of recommendation to the Custos, as did Wyndham Goodden in 1820, a barrister living in Bath who served as a Commissioner on the Axe Drainage. He recommended his three sons, only one of whom was appointed that year because it was found the others were not of age¹⁹. The sense of cohesion generated by serving alongside relatives was matched by the capacity of these families for self-renewal. When main lines failed, estates often passed by marriage or kinship into the hands of distant lines or connections by marriage, able to maintain family continuity. These shifts of fortune were signalled by a change or modification of name. In north Somerset for example, a marriage alliance between the

Gore and Langton families led to the permanent harnessing of these names²⁰, although one between the Coxes and the Hippisleys led eventually to the dropping of the former²¹. A name changed to secure an inheritance can also mislead as when John Smith of Combe Hay who had qualified as a justice in 1759, became John Leigh of the same and qualified under his new name in 1803²².

Behind these and similar manoeuvres in Somerset lay the wish to secure and extend landed interests, essential for status in the county. Membership of the Commission of the Peace signalled an achievement beyond the reach of those unable to meet certain requirements. Under the Justices Qualification Act of 1744/5 estates had to have a yearly value of £100 clear of all incumbrances, a figure reviewed over the years²³. A letter of 1820 from William Adair (a barrister consulted by one of the gunpowder companies about storage in Bristol), shows how a family might help meet this qualification. He recommended his son for inclusion in the new Commission on the grounds that although he had quit the legal profession through ill-health, this training left him 'better qualified to act as a Magistrate than Country Gentlemen in general are'. He had 'lately purchased a Freehold Estate in the County', the yearly value of which he did not exactly know but, he added, 'if not sufficient to qualify Him as to Property, I will make up the deficiency'²⁴. Father and son were both named in the ensuing Commission.

The steadily increasing number of clergymen included has been mentioned, and from the turn of the century they made up at least one quarter of the effective list. They were acceptable because they helped provide resident supervision of the growing population, especially in north Somerset. But standards had to be maintained, and a clergyman holding the living of East Harptree was rejected in 1814 with the terse comment, 'Vicarage, no other ppty'²⁵. Doubts were stilled in one case by the news that a rectory of Emmanuel College was probably worth £1000 per annum, though not all such livings were so well provided²⁶. The financial stringency experienced by some is revealed by Thomas Brown Simpson of Brislington near Bristol, vicar of Keynsham and Congresbury. He wrote in 1814 that he was likely to part with his small freehold estate in Keynsham, 'finding the public funds a much more convenient source of income to a clergyman'. However should it be thought 'expedient under the circumstances to nominate me, I acquiesce'. The appearance of his name in the Commission of that year suggests that the needs of north Somerset were great enough for this deficiency to be overlooked²⁷.

But if property already declared on oath was sold, the qualification was nullified. In 1814 Captain Lorraine Baker put Chewton Priory (later the home of the Waldegrave family) up for sale, and his sponsor Mr. W Dickinson said had he known he would not have recommended him for the Commission that year. Bankruptcy produced even greater disapproval. In notes preceding

the Commission of 1820 it was observed that three justices had become bankrupt, and all were removed from the list. They were Edward Wright Band, and Matthew and John Brickdale esquires, all from important commercial families in Bristol and north Somerset, who had provided the region with members of parliament, sheriffs, commissioners of sewers, and turnpike trustees. Their financial ruin spelled an end to public works and the status and opportunities this conferred²⁸.

Justices were often consulted about the property qualifications of prospective colleagues, as in 1819 when Edward Strachey of Ashwick Grove near Shepton Mallet was dismissed as 'An East Indian. His property is merely a House and a few Acres of land - an intelligent Man'. He did not find favour with the Custos²⁹. In 1814 John Fisher esq. of Langford near Bristol replied to an enquiry, that Mr Croft and Mr Roworth were both well-qualified in location and property, being independent gentlemen living on their estates valued at about £3,000 and £1,500 per annum, respectively. He was careful to add that they practised no business or trade, an important qualification since active participation in either could spell ineligibility for the Bench. In response to an enquiry about Thomas Hassell in 1823 for example, Sir Abraham Elton said he had 'made his fortune in a wholesale trade of some respectability in Bristol, although an inhabitant of many years standing in the parish of Bedminster'. He went on, 'the trade I am given to understand he is willing to decline, and thereby

put himself out of the reach of bankruptcy if that is the only objection to his being in the Commission of the peace...My own opinion is, that he is a man of capacity & fully equal, if not superior to more than one Justice known to you and me'. Robert Phippen of Badgworth House near Axbridge, a grazier, had posed a similar problem in 1814, but after much correspondence his patron Mr W.Dickinson was able to confirm that he had taken steps towards retirement from business³⁰.

The case of Samuel Birch whose business and banking career ended under a cloud, illustrates the hazard of mixing such concerns with the administration of justice. Criticism was muted by the service he had rendered, but it was noted in 1824 that this 'most excellent Magistrate has been unfortunate in life & has retired to Cheddar & does not interfere in the Affairs of the Public'. Samuel Birch had qualified for the magistracy in 1814 through the properties in Cheddar to which he later retired, and in securing which he had changed his name from New. But his business interests were centred in Bristol where this West Indian trader was managing partner of the Miles Bank from 1794 to 1808 and founding partner of the bank of Birch, Pitt and Company from 1808 until 1819. This firm had connections with a brass manufactory that ceased production in 1820, and this may have been the source of his misfortunes³¹.

Another banker who became a justice in 1814 was John Charles Tuffnell of the Bladud Bank in Bath, marking a trend which made

John Acland (chairman of the magistrates from 1804 until that year) fearful that the independence of the Commission was being compromised by such nominations. He noted that contrary to Lord Poulett's principles many had been 'admitted to the Magistracy during the Exercise of their professional Employments'. As if to counteract this tendency he in turn nominated several 'fit and proper Gentlemen', including Robert Freeke Gould of Minehead, a clergyman brother of Lady Strafford, with an estate of £500 independent of his living. The contrast between these two nominees may exemplify a developing difference of attitude between the northern third of the county, anxious to enrol professional and business men as magistrates, and the rest of Somerset which still clung to the idea of the independent country gentleman. Time was on the side of the former, especially as Mr Tuffnell was supported by both Wm. Dickinson, county M.P. from 1806 to the 1830s, and George Edward Allen of Bathampton, county sheriff in 1814, although in 1815 another banker suffered rejection, despite being nominated by the Bishop of Bath and Wells . He was Daniel Payne of the Wells Bank in that place and the Bladud Bank in Bath.³²

Attorneys were similarly unwelcome. In 1814 Robert Uttermare of Langport slipped into the Commission, but when this was discovered Lord Poulett took the view that he could not be both an attorney and a justice and wrote 'The name must be taken from the List of Attorneys'. The advice to Uttermare from Lincoln's Inn was that provided he did not take out a

certificate entitling him to practise in the coming year he would be eligible to act as a justice. Lord Poulett remained adamant and Uttermare's name was removed from the Roll of Attorneys. He then served as a 'very useful magistrate' until his death in 1824 when steps were taken to secure the services of his son. He was far more conventionally attractive to the Bench, for he was 'a young man of large fortune, educated at Cambridge, where he showed more than usual ability and application'. He was nominated and qualified in 1824³³.

These strictures against the inclusion of still-active entrepreneurs and professional men in the Commissions did not apply to the main boroughs of Somerset, where justice was administered independently of the county. In north Somerset members of the corporations of Bath, Axbridge, and Wells served in this office by turn, so the duty was there performed by merchants, tradesmen, and professionals of middling status. The fact that some Somerset justices lived in these same boroughs, creating there a distinct class of magistrates who were 'urban gentry', must have made for difficult relations between town and county. In Bath in 1818 for example the city justices sat daily in the Guildhall, on a Bench drawn from ten active magistrates chaired by the mayor, whilst county justices acting for the division of Bath Forum (around Bath but excluding it), met at the same place every Tuesday under the retired county chairman now Sir John Acland. He could call on twenty nine active justices whose ranks included baronets, landowners, and

eminent clergymen. Of the thirty, two-thirds including Sir John resided in Bath, despite their interests beyond the city³⁴. There was little overlap between the groups, and in 1818 only four magistrates were active in both³⁵.

The administration of justice in Bristol was similarly separate from that in Gloucestershire, but unlike the Somerset boroughs a significant number of the 'middling sort' of the city also served in county Commissions of the Peace. This may reveal both the greater riches and social standing of the merchants and professional men of Bristol in the eighteenth century, and the earlier familiarity with and acceptance of wealth from trade in Gloucestershire, where landowners and clothiers had long sat on the Bench together³⁶. The acceptability of justices of lesser social standing may also have been a matter of political expediency. Correspondence about the Commission in 1750 referred to the need to retain the strength of the Whig element within it, and to this end thirty five names were submitted to Lord Berkeley, Lord Lieutenant and head of the Whig interest in the county³⁷. The fact that almost half those named were Bristol merchants and professional men is a measure of the importance of the Whigs in that city.

In Somerset, political life was made more complicated by an attachment to losing causes, such as those of Monmouth and the Jacobites. The leading politician Sir William Wyndham was several times entangled with the latter before his death in

1740, and in the first half of the century local Tory gentlemen were usually returned unopposed to the Commons, but the tide began to turn when the former Tory leader Lord Poulett went over to the Government. Nine of the Bristol Whigs named in the 1750 Gloucestershire list had by 1775 been included in Somerset Commissions³⁸, possibly for political reasons, although as noted earlier, some Bristolians were by the end of the century becoming Somerset justices because of the need to cope with the rising population in the southern suburbs of the city. Whether for practical or political motives, this recruitment had the effect of further infusing the Somerset Commissions with men of entrepreneurial spirit who had built up their fortunes through enterprise, and who met the qualifications by purchase of property rather than inheritance. They formed a more promising source of investment capital than the traditional gentry of Somerset, although as will be seen not all of the latter can be ruled out in this matter as clearly as can the nobility.

Evidence on both the upper and middle groups is deficient, but less seriously so than for the 'lower orders', most of whom retain their anonymity. A few, perhaps small coal masters, rose from below and are known by name. Others enter the records only by infringements of the law, either as individuals, for example hard-drinking Mendip miners, or as groups, usually rioters. Although unlikely to provide a source of evidence on investment finance, these instances can be very revealing about the economy of the region. For example from the second half of the

sixteenth century food from Somerset especially grain was supplied to Bristol, the surrounding counties, Ireland, and the army, but in times of scarcity such markets were held to worsen conditions in the county, and riots erupted. Fury was often focussed on badgers or corn traders, six of whom were shown in Returns of 1623 to be based in Hartcliffe and Bedminster for the supply of Bristol. These Returns also revealed a shortage of grain in the Frome Hundred, where many workers were employed in cloth making rather than agriculture. Trade depressions in the mid-seventeenth century led to rioting in the textile areas of the Somerset/ Wiltshire border as hungry mobs saw grain carried to Bristol³⁹.

From the early decades of the eighteenth century the problems of these landless workers were brought into even sharper focus by the activities of the coal miners of Kingswood, on the north Somerset border. In 1709 they marched on Bristol to secure lower grain prices, reinforcing this intimidation over the years by rifling ships bound for Ireland, exacting protection money from villagers, and taking part in food riots. Their reputation was so great that in 1726/7 the Wiltshire weavers called for their help in an industrial dispute and in 1738 they fought their own battle against wage reductions. But it was with their violent opposition to the introduction of turnpike tolls on the Bristol roads in 1727, which they feared would limit their freedom to sell coal in that city, that their protests can be seen to be aimed not only

at the subsistence struggle but also at the changing economic order itself. It might have been thought that the gentry would be united in their desire to quell this rebelliousness, but this may not have been so. Describing an attack by 400 colliers on Dyrham Park, home of William Blathwaite, a Somerset justice and defender of the turnpikes, his neighbour Sir William Codrington observed in 1731 that '...these wretches would never have been so impudent if they had not been prompted by men of some fortune and figure'. And in 1749 when the Bristol turnpike gates were again destroyed, by mobs with farming as well as mining interests, the attitude of the gentry was said to have increased the difficulties. Underlying these sympathies was an attachment to the old order, seen in Dr. Johnson's words copied into Mr. Wyndham's diary over thirty years later, that 'by furnishing a market to each man's abilities, and destroying the dependence of one man on another', the new roads disrupted families and disunited society⁴⁰. Perhaps exemplifying this distrust of the new world was the concern expressed at the forced embarkation for America in 1756 of the Somerset militia, previously only a force to defend the county⁴¹.

Whether the unrest in north Somerset in the middle decades of the eighteenth century was a lament for a passing 'moral economy' or a protest at the failure of the market structures replacing it, cannot be explored further here, but it serves to

complete this picture of the social structure of the region. There was some dissent and disorder, but not enough to generate the uncertainty which might have inhibited economic change. It was in any case contained by justices drawn largely from the gentry and clergy, whose homes were widely distributed within the region (with the exception of the sparsely-populated Mendips and Levels), and by the burgesses in towns. Their power and position was enhanced by the almost complete absence of great noble families able to exert a strong influence for good or ill. This may seem an unlikely context in which to seek the dynamism needed to transform a traditional society into an entrepreneurial one, but as will be seen part of this impetus came from those gentry and townspeople within the region who saw the advantages of combining the pursuit of private profit with the performance of public service. Two further factors still to be explored are the proximity of Bristol which made this region more open to change than would otherwise have been the case, and enabled links to be forged between the entrepreneurs and economies of the two, and the presence of large bodies of professionals, especially lawyers and bankers, able to facilitate and promote economic change.

- 1 Pole, 'Crime, Society and Law', pp.130-5, especially p.134.
- 2 SRO, Q/JC, Commissions of the Peace, 1612-1864: 111, 1741; 112, 1749; 113, 1757; 114, 1758; 115, 1761; 116, 1766; 117, 1775; 118, 1787; 119, 1794; 120, 1814, June; 121, 1814, Nov. (due to errors in previous one); 122, 1820; 123, 1828; 124, 1830. In contrast none was issued for Gloucestershire between 1767 and 1809, new names being added yearly, Esther Moir, Local Government in Gloucestershire 1775-1800, (Bristol, 1969), pp.42-5, p.76, n.25.
- 3 SRO, Q/JQ/6 & J/O, Oaths of Office, of allegiance & dedimus potestatum (the document which authorized justices to take the oaths of office), and declarations as to property qualifications, 9 rolls including: 1749-56; 1758-73; 1775-1820; 1821-30.
- 4 SRO, Q/JQ/1, Justice Qualification Act, 1744/45, 18 Geo. II, c.20.
- 5 Collinson, History of Somerset (1791); Richard Locke, Supplement to Collinson's History of Somerset, with a short biography by F.M. Ward, and foreword by R.B. Mowat (Taunton, 1939).
- 6 SRO, Q/JCp5/2, letter from J. Pensam Serj. at Law, to Edward Coles Clerk to the Somerset Justices, 4 March 1820. .
- 7 Barnes, Somerset 1625-1640, p.11. The name was spelt Poulet(t) or more anciently Paw(u)let.
- 8 Collinson, History of Somerset, vol. II, pp.165-8. Lord Poulett's youngest son was named Lord Anne in honour of the Queen his godmother; Burke, Peerage and Baronetage, pp.930-1.
- 9 Dunning, Somerset (1983). Lords Lieutenants of Somerset are listed in Appendix Two, pp.108-09.
- 10 Brit. Lib. Add. MSS. 35603, f135 & f145.
- 11 The Wyndham family's main estate was at Orchard Wyndham near Watchet but other properties were sold, for example the manor of Witham Friary to William Beckford, Collinson, History of Somerset vol. II, p.234, vol. III, p.489; Romney Sedgwick, The House of Commons (1970), vol. II, pp.432, 564; Burke, Peerage and Baronetage, pp.537, 1061; Dunning, Somerset (1983), pp.77-9.
- 12 Barnes, Somerset, p.132, n.21; Collinson, History of Somerset, vol. II, pp.129, 188-9, 194, 212, 216, 306, vol. III, 170, 188, 425, 470, 559, 575; Burke, Peerage and Baronetage, pp.74-6.
- 13 Collinson, History of Somerset, vol. I, p.188, vol. II, 133, 393, 403-5, 431, vol. III, 347-8, 432, 467, 605; Locke, Survey of Somerset, pp.40, 97; Neale, Bath, pp.116-51; Burke, Peer. and Baron., pp.153-5.
- 14 Collinson, History of Somerset, vol. II, pp.117-8, 457-8, vol. III, 433, 541; Locke, Survey of Somerset, pp.86, 126, 135; Robinson, West Country Manors, pp.49-53; Burke, Peer. and Baron., pp.1170-1.

15 Collinson,History of Somerset,vol.II,pp.95-6; Burke,Peerage and Baronetage,pp.75,1180-1; C.G.Down & A.J.Warrington,Somerset Coalfield(Newton Abbot,n.d.),pp.71-82.

16 Collinson,History of Somerset,lists estates confiscated,vol. I,33,vol.II,pp.138-9,148,150,211,284,378,459,vol.III,pp.100, 340,375,462,587; Dunning,Somerset(1978),describes agricultural and coal mining developments on Duchy manors,pp.48-9,52.

17 See,T.J.Raybould,The Economic Emergence of the Black Country a Study of the Dudley Estate(Newton Abbot,1972),also his 'Aristocratic Landowners and the Industrial Revolution: the Black Country Experience',Midland Hist.,IX(1984),pp.59-86,

18 Moir,J.Ps.in Gloucestershire,pp.19-22; Sedgwick,House of Commons vol.I,pp.243-4.

19 SRO,Q/JCp2/8,letter from Wyndham Goodden of Bath to Edward Coles,8 Feb.1820, and his reply, 4 March,1820.

20 The Langton family, merchants and mayors of Bristol, bought the manor of Newton near Bath in 1666 and a century later built a fine house there.In 1783 Bridget,an only child, married William Gore,descended from London merchants and mayors who settled at Barrow Court near Bristol.He assumed the additional name and arms of Langton,and Gore Langton became the family name.

21 Margaret,sole heir to the Hippisley estates at Ston Easton married John Coxe of the city of London. The name Hippisley Coxe was assumed by the family and a mansion built. Failing an heir the estates passed to a sister, married to an Hippisley cousin. From the end of the eighteenth century this became the more important surname.By 1814 Sir John Coxe Hippisley Bt. had struck the 'e' from Coxe (SRO,Q/JCp2/11), which was not borne at all by his successor in 1828, Sir John Stuart Hippisley. Information here and n.20 pieced together from several sources.

22 SRO,Q/JQ1,'Justices Oaths and Declarations as to Property Qualifications'.A first entry refers to 'the qualif of John Smith of Comb Hay esq entd in the abjuration roll 27 Feb.1759 at sessions then held by adjment', and a second for 20 April 1803 reads 'John Leigh of Comb Hay,Somerset,Esq, late called John Smith of sd parish of Combhay Esq'.

23 18 Geo.II,c.20,1744/5.Justices had to possess an estate to the annual income of £100p.a.or be heir to one of £300p.a. An estate was widely defined to include messuages,lands,tenements and hereditaments,rents, tithes, benefices,and offices.On taking the oath,the parishes in which estates were held had to be named,SRO,Q/JQ1,'Justices Oaths and Declarations'; Landau,Justices of the Peace 1679-1760(Univ.Calif.P.,1984),pp.146-70.

24 SRO,Q/JCp2,letter from William Adair of Great Cumberland Place,esq.,to Edward Coles,28 Feb.1820.

25 SRO,Q/JCp1/15,letter from Rev.H.Parsons of Goathurst to Lord Poulett,1 Sept.1814,recommending his clergyman brother John for inclusion in the amended Commission of Nov.1814. On the outside was the order,'To ascertain if Mr.P has ppty within ye county'.

26 SRO,Q/JCp1/35, a letter of 23 Nov.1814 from John Acland of Fairfield esq.to Edward Coles sums up the qualities sought. The Rev.Charles Tripp was 27 and expecting a benefice in Somerset. He came from a family of 'mature growth',with a landed property in the county 'treble in value to the Qualification of a Magistrate'.He was steady and sensible,and was going to be married. He would make a useful resident clergyman and magistrate.

27 SRO,Q/JCp1/29b,letter from Tho.Brown Simpson,of Brislington near Bristol,esq.,20 October 1814,enclosed in letter of 1 Nov. 1814 from W.Dickinson of Kingweston,esq., to Edward Coles.

28 SRO,Q/JCp1/29,letter from W.Dickinson of Kingweston esq.,to Edward Coles,1 Nov.1814.Over the period covered only 16 justices had military or naval rank; Q/JCp2,10,Draft Alterations and Additions to Commission of Peace,since its issuing 1814.

29 SRO,Q/JCp2/9c,Draft list of names recommended for Insertion in the Commission of the Peace. Edward Strachey,brother of Sir Henry,had been recommended by Wm.Dickinson.

30 SRO,Q/JCp1/33,letter from John Fisher of Langford near Bristol esq.to Edward Cole,12 Nov.1814; Q/JCp3/6,letter from Sir Abraham Elton of Clevedon Court to Edward Coles,6 Sept.1823; Q/JCp1/31, letter from W.Dickinson of Kingweston esq.to Edward Coles,8 Nov.1814,including a note by Robert Phippen affirming that 'The little Grazing carried on in my name is managed wholly by a person kept for that purpose,who is directly to take the business on his own account'.

31 SRO,Q/JCp4,7,letter from Mr.J.Chadwick,Clerk to the Bristol Justices to Edward Coles,26 May 1824;Day Bristol Brass,pp.130-1.

32 SRO,Q/JCp1/21,letter from John Acland of Fairfield esq. to Lord Poulett,9 Oct.1814; Q/JCp1/41,letter from J.C.Tuffnell of the Bladud Bank,Bath,to Edward Coles,27 Dec.1816 (but stamped 1814); Q/JCp1/4,letter from Thos Beagly on behalf of Lord Poulett to Edward Coles,14 Jan.1815,on the nomination of Daniel P. Payne esq..

33 SRO,Q/JCp1/5,26,30,five letters from Mr.Uttermare of Ashill near Ilminster to Edward Coles, Oct.- Nov.1814; Q/JCp4/5,letter from Mr.Richard Thomas Combes of Earnshill to Edward Coles, 22 May 1824,recommending the late Mr.Uttermare's son; Brit.Lib. Add.MSS.35603,f258, letter from Lord Berkeley to 'his Lordship' (Hardwicke?) about withdrawing attorneys from the list, shows that similar problems were encountered in Gloucestershire.

34 SRO,Q/JCp2/1,'List of acting Justices with the Divisions of the County, places and times of meetings, Residences of Justices, and distances they have to travel to meetings'.

35 These were George Edward Allen of Bathampton esq.,of the famous Bath family,county sheriff,1814; Edmund Anderdon of Queen Square,esq.,and of Cannington near Bridgwater; William Clarke of Walcot,Bath esq.,porter brewer,turnpike trustee; and Charles Crook of Walcot esq.,and of Batheaston,turnpike trustee.

36 Moir,J.Ps.in Gloucestershire,pp.50-1.

37 Brit.Lib.Add.MSS.35603,f251-2,f253-4,f255, letters from Robert Tracy and Sir Francis Fust bt.,Sept 1750,with a list of Whig supporters drawn up by the latter. Sir Francis became a Somerset justice in 1757, having married a Portishead heiress.

38 Brit.Lib.Add.MSS.35603 f255. Nominees in the Gloucestershire list of 1750 who became Somerset justices in the next 25 years were: Thomas Fane;Nicholas Tooker;James Purnell;Richard Nelmes; Denton Fust;Abraham Isaac Elton;Morgan Smith and Thomas Tyndale.

39 V.C.H.Somerset,II,pp.307-8;Andrew Charlesworth, Atlas of Rural Protest(1982),pp.72-99; John Stevenson,Popular Disturbances in England, 1700-1870(1979),pp.92-6.

40 Robert W.Malcolmson,'"A Set of Ungovernable People"; the Kingswood colliers in the eighteenth century',in Brewer & Styles,An Ungovernable People,pp.93-124; Charlesworth,Atlas of Rural Protest,pp.119-121; John Latimer,Annals of Bristol(1893,Bath reprint 1970),II,pp.157,275-6. Latimer quotes the following from a private account book of Mr.Gore of Barrow Court: 'August 26 1753. To Mr.Hardwick on my account,for cutting down the turnpikes,£10'. Malcolmson,pp.104-6,discusses the possible role of gentlemen in these disorders and concludes that although contemporaries suspected sympathy between Tory gentry and colliers the actions of the latter can be adequately explained in terms of factors influencing their lives.

41 Walter J.Shelton,'Hunger Riots of 1766',Albion,V,i(1973), pp.50-66,esp.59,65; Dale E.Williams,'Morals,Markets and the English Crowd in 1766',Past and Present,CIV(1984), pp.56-73,esp.72.

Chapter 4 Interactions between North Somerset and Bristol

Bristol and north Somerset are close in terms of location, but the extent to which they were linked beyond the level of mere proximity, and the pattern which this relationship assumed at different times, has received little historical study. The traditional economy of the well-populated northern third of the county has already been outlined, with its wealth based on the long practice of agriculture; wool textile manufacture; and the mining of lead, calamine, and coal. Bristol in contrast owed its importance to the growth of commercial enterprise in the Middle Ages, before which it had been only a small settlement by the crossing of the Avon with neither Roman ancestry nor early ecclesiastical or administrative prominence¹. It thrived instead on its natural endowment, which provided harbour facilities adequate for the ships of the time, and access by the River Avon to the Severn estuary, Bristol Channel, and western seas. Its rapidly increasing population was engaged successfully in regional trade and overseas enterprise. But these basic factors alone would not have produced the growth which led to Bristol outdistancing such early rivals as Southampton and Boston. For that, interaction with a close and active hinterland was required such as Bristol possessed especially in relation to north Somerset.

The importance of Bristol as a regional metropolis began in mediaeval times, with the city acting 'as entrepot and centre

of distribution for a wide area ranging from the far west of England to the upper Severn basin and from Wiltshire to South Wales'. Into the port came goods from the region such as wool, hides, timber, and coal from Wales, and tin and fish from Cornwall, as well as imports such as wine from Gascony. These were consumed locally or sent out on inland or coastal trade routes together with the products of Bristol's own industries such as soap and leather goods. Fine cloth was exported².

For the eighteenth century the developing pattern of Bristol's overseas commerce was shown by Walter Minchinton to depend on the continuing significance of the Irish and Spanish trades, the important though fluctuating Virginia and Africa trades, and the development of West Indian trade. It was the last with which Bristol's eighteenth century prosperity was mainly associated, with sugar the most important commodity, backed up by imports of rum and tobacco, and with the slave trade underlying the whole system. This concentration on one area of commerce proved dangerous in the long run, as other trades came to grow more rapidly. In the eighteenth century however, imports from the West Indies sustained such Bristol industries as sugar refining, distilling, and tobacco processing; and the demands of this and other markets promoted the growing manufacture of glass, brass, copper, iron, and pottery goods, and brick making³.

Regional trade at this time depended in part on agricultural specialization. Barley, oats, and butter came from west Wales for example, and cheese from Cheshire, cider and perry from Devonshire and Hertfordshire, and vegetables from the Vales of Evesham and Glamorgan. Potatoes from south Gloucestershire were increasingly important in the eighteenth century. Industrial raw materials were also a significant part of the entrepot trade, and they included shipbuilding timber from the Forest of Dean and the Baltic; tin from Cornwall for works in South Wales or the Midlands; and both wool from South Wales and teazles from Somerset for the Cotswold woollen industry. For Bristol's own industries came copper from Anglesey; wood ashes and kelp for soap making from Somerset ports; and clay from Stourbridge for glass making. Despite the availability of coal from Kingswood, supplies from South Wales came increasingly into Bristol⁴. The city's success as a distribution centre depended on access to transport facilities, neatly summarized by a mid-eighteenth century observer who noted that 'By the Severn and the Wye, the Inhabitants of this City have almost the whole Trade of South Wales; and by land-carriage they send goods to Exeter, Bath, Wells, Froome, and all the principal Townes from Southampton to the Banks of the Trent'⁵.

Bristol's importance as a regional metropolis has thus been long recognized, but there are two disadvantages to these accounts. First, in establishing the extensive nature of its trading and commercial influence, the more intensive nature of

Bristol's links with its immediate hinterland have been neglected. This deficiency can only be partly remedied by the present study, for this has north Somerset rather than the port as its focus, and the role of south Gloucestershire must be left for future research. Second, earlier accounts have concentrated on the distribution of food and raw materials, and of imported and locally produced goods, almost to the exclusion of other forms of interaction. These include the movements of people between the two, and also of investment capital and expertise. It is true that Minchinton draws attention to the importance of Bristol as a source of capital for metal and mining enterprises from the early eighteenth century, but his heavy reliance on the work of A.H. John on South Wales leads to the prejudiced conclusion that 'Outside south Wales Bristol investment was slight and scattered'. This shows an unfamiliarity with developments in north Somerset that is especially serious in relation to industries like gunpowder making which, although located at several rural sites, were dependent on the commercial and financial facilities of the port. Bristol's banks are treated in a similarly perfunctory manner, with attention paid to the connections with South Wales rather than those with the nearby hinterland⁶.

However a close relationship between Bristol and north Somerset had been established early, on the basis of their specialized but complementary functions. Steps taken towards the growth of a money economy on some Somerset manors of the

thirteenth century permitted the purchase of luxuries such as wine, wax, silk, and fine cloth from Bristol, with funds raised by the sale of corn, cattle, sheep, and later of wool. From the fourteenth century young cattle were purchased at large markets in Bristol for re-sale there after grazing on Somerset's rich pastures, and as beasts on the hoof were increasingly brought ashore from South Wales at places like Uphill, they too were fattened locally before being sold in urban markets. The sale of corn to Bristol was also a regular part of the commerce between port and hinterland, though it has been seen that this practice caused great resentment in times of scarcity. This inland trade was subject to regulations, and badgers' licences in the order books of the Somerset Quarter Sessions show that Bristol was a valuable market for butter and cheese as well as corn. Grain was exported to Ireland through Bristol, by licence, and from the early eighteenth century ships in the Africa trade were provisioned with peas and beans grown in the region. Proximity to Bristol's growing urban market also encouraged the development of dairying and market gardening in parishes such as Long Ashton, from which fresh goods could be transported to the city ⁷.

Bristol was an important market for labour as well as goods. Registers of the mid-seventeenth century for apprentices in the city and for indentured 'Servants to foreign plantations', show that more than 75 per cent of the former and 60 per cent of the latter came from within a 40 miles radius of Bristol, with

Somerset as the most important source of servants beyond that limit. It is David Souden's view that although for reasons of age-, sex-, and status-bias, apprentice migration may not have been representative of the general pattern, the movement of indentured servants into Bristol en route to the New World did reveal the general trend. And this shows that migrants from Somerset came particularly from the northern third, from pastoral settlements in the forest of Selwood on the eastern border, and from clothworking towns like Frome, Bath, and Wells. These moves were based less on population pressure than the need to seek opportunities away from marginal wood and pasture land, and depressed trades⁸.

Over 10,000 men and women passed through Bristol to the New World in the third quarter of the seventeenth century, but many others stayed and contributed to its growing size and economy. Souden speculates that the doubling of Bristol's population over two centuries to reach about 20,000 in 1700, may be due almost entirely to net immigration, given the prevailing levels of urban mortality. An important number of these migrants were women, whose movement into towns like Bristol was a response to the growing employment opportunities to be found in domestic work, inns, and shops, which reflected the increasing affluence of the city, especially amongst the households of its merchant and professional men. In general women found work through family links, but village, trade, and even county connections were important to all migrants. Like most leading cities

Bristol had several well-established county societies, meeting convivially to help incomers. Substantial funds were raised for apprenticeship schemes, relief of the poor and the support of women in childbirth⁹. In 1776 Richard Hippisley Coxe of Ston Easton, county M.P. from 1768 to 1784, was President of the Society of Somerset Gentlemen in Bristol¹⁰.

W.K.Jordan's studies of charitable giving in the sixteenth and seventeenth centuries have been much criticised¹¹, but his account of the situation in Bristol and Somerset is useful because it provides further evidence of connections between the two. Some of the Bristol donors came originally from the county and made bequests to the parish of their birth. Others who were not necessarily born in Somerset purchased estates there to provide an endowment for Bristol charities. An example of the former is the merchant Thomas Jones of Stowey some eight miles south of Bristol, where his family were lords of the manor until the end of the eighteenth century. In the 1620s he established a fund valued at £380, arranging that the mayor and aldermen of Bristol should use the capital to finance loans to needy young men pursuing a lawful trade, and the annual income to provide gifts for the poor and quarterly sermons in Stowey church¹². John Whitson who died in 1629 is an example of the latter. A native of Gloucestershire this great Bristol merchant purchased lands in Somerset including the manor of Burnett near Keynsham, which he entrusted to the Corporation of Bristol as an endowment for Red Maids' School there¹³.

The continuing significance of the charitable inclinations of these and other benefactors is that it placed the administration of a number of estates in north Somerset in the hands of Bristol trustees. Not only did the Corporation hold Burnett for the Red Maids' School, it also held the manors of Congresbury and Wick and the living of Stockland for Queen Elizabeth's Hospital¹⁴. From the mid-sixteenth century the Corporation also began to acquire lands in its own right. In 1616 it purchased the manor of Portishead where it held the largest estate, inconveniently intermixed with land in Weston-in-Gordano. The living was in the Corporation's gift here as in other cases, for example Kewstoke. The Bishop of Bristol, and the Dean and Chapter, were patrons of at least another half dozen livings in north Somerset, thus strengthening these parochial links¹⁵. The Society of Merchant Venturers had vested in it the properties acquired by Bristol's greatest benefactor, Edward Colston, who died in 1721. He financed the Bristol school bearing his name chiefly by settling upon it in 1708 the manor of Locking near Weston-super-Mare, following its confiscation after Monmouth's Rebellion. The Hall Books of the Merchant Venturers show that the Society was concerned with the enclosure of moorland at Locking in 1800, and with presentations to the vicarage until this right was auctioned in 1813 for £665. In 1800 this was one of several parishes to whom donations for the poor were made¹⁶. The Society owned other estates in its own right, for example the manor of Rowberrow on western Mendip, important for the extraction of calamine. Their

interest in north Somerset extended to the construction of a church tower on Dundry Hill, and the support of a lighthouse on Flat Holme near the mouth of the Avon, as land- and sea-marks to help ships avoid danger¹⁷.

The exercise of trusteeship and patronage by these institutions enhanced the influence of Bristol within north Somerset, for it was common for lands to be leased to, and livings filled by, those associated with the city. For example in the second half of the eighteenth century the manor of Rowberrow was leased by William Symmer and then his son, of the prominent Bristol merchant family, active from the end of the seventeenth century in the African and sugar trades, office holders in the city and Society of Merchant Venturers, and Justices of the Peace in Somerset¹⁸. Samuel Day to whom the manor of Burnett was leased in the later eighteenth century came from a similar family, with Jamaican and slave trading interests¹⁹. Rectorial interests were also leased out, those in Congresbury having been granted to Samuel Worrall of another successful Bristol family, three generations of whom were stamp distributors there in the eighteenth century. An attorney by profession he was clerk to the Society of Merchant Venturers from 1757, and a partner in the Exchange Bank from 1766 until his death in 1804²⁰.

It might be thought that the involvement of successful Bristol entrepreneurs would have speeded the modernization of

the type of lease in use by these institutions, but this was not so. Sir Abraham Elton of Clevedon Court for example was familiar with the city's commercial practices, yet he held a traditional Somerset lease for lives on the rectorial manor and great tithe of the parish of Portbury from the Bishop of Bristol, as did Dr. Dennis Leman with his lease for lives of the glebe and great tithe of Worle and Kewstoke, of which the Corporation was the impropiator²¹. Throughout the period studied the major part of the parish of Walton-in-Gordano was also held on an old-fashioned lease, again by a Bristol family who were no strangers to new practices. These were the Durbins, of whom Sir John was both knighted and married in 1761 to an heiress with a fortune of £10,000. But a lease for lives was the basis on which he held his estate and qualified as a Somerset justice, in which service he was joined by four other members of his family in the years studied²². These examples of men who were capable of negotiating the best deal for themselves and their heirs accepting leases for lives, suggests there may have been advantages to the lessee, perhaps in terms of a greater security of tenure with fewer restrictions, than was the case with leases for years²³.

The close relationship between Bristol and north Somerset was further cemented by businessmen of the former acquiring estates in the latter, apart from these institutional links. The Elton family are such a case, commercial magnates who from the later decades of the seventeenth century built up a great

fortune, especially through the manufacture and trade of copper and brass ware, glass, and gunpowder. In 1709 an estate was purchased from the Earl of Bristol in northwest Somerset, with lands in Clevedon, Tickenham, and Failand. A baronetcy came in 1717. This investment and elevation did not herald a retirement from the life of the city, for this or several other merchant families who followed a similar course. The fourth baronet was town clerk from 1753 to 1786, and it was only with his death in 1790 that religion and the arts began to be more important than business. Even then the work of enclosure, drainage, and transport was not neglected, and the family served with diligence on the Bench of their adopted county, fifteen being named in Commissions of the Peace over the period studied. And the interest of the younger branch in merchanting and manufacturing continued to flourish, with an added involvement in banking from 1750. Landed and business interests came together when a gunpowder mill was built on their estate at Winford²⁴.

The Smyths were close neighbours of the Eltons, Bristol merchants who purchased the manor of Long Ashton in 1545 and later built their residence there. Other lands in north Somerset were also acquired, and a baronetcy was created in 1661 though the title ended eighty years later through a failure of male heirs. A division of the inheritance amongst three surviving sisters might have dissipated the fortune, had not one of them married Jarrit Smith in 1732, an attorney closely involved with mercantile life in Bristol. A baronetcy

came in 1763, and Sir Jarrit displayed a similar concern for business and the land as his Elton contemporaries. But the pattern of inheritance was more complicated, for the marriage of different heiresses established links with other families such as the Costers, closely involved in the copper industry in Cornwall and South Wales as well as Bristol and north Somerset; the Pigotts, early nineteenth century developers of Weston-super-Mare; and the Gores, whose association with the Langton family has already been noted²⁵.

The Dickinsons exhibit the same links, though their web of fortune grew from estates in Jamaica acquired in the later seventeenth century by a captain whose descendants chose Bristol as the appropriate place from which to conduct business with the West Indies. They married into the well-established Bristol families of Vickris, Prankard, Goldney, Harford, Barnard, and Reeves, all of impeccable mercantile credentials. The Dickinsons continued to be closely concerned with Bristol trade and industry, but also developed business connections with London, especially in relation to brass, copper, and sugar. A landed estate was purchased by Caleb Dickinson at Kingweston twelve miles south of Wells, which was home for three generations of Williams born between 1745 and 1820. Locke refers with approval to the agricultural improvements carried out on this 'maiden manor, so called because the whole of it is the property of one individual in demesne, who resides in an elegant modern built mansion near the church in the centre of

the parish'. In 1769 Caleb's younger brother Vickris purchased Queen Charlton manor five miles south east of Bristol. The family continued to serve both the region and their business interests, in Bristol and London. They developed their estates; served on the Bench (six justices in the years studied); and represented the county in Parliament for thirty five years²⁶.

The suggestion that the investment in landed estates in north Somerset of large fortunes made in Bristol, did not in this period necessarily lead to a neglect of former business interests, may be made also of investors on a smaller scale. For example the purchase of the manors of Chew Stoke and Butcombe near Wrington by John Savery did not signal his retirement from the Bristol bank of Savery, Towgood, and Co. of which he was a partner from 1792 until the business was given up in 1828. Although living on Kingsdown Parade in the city at his death in 1830, his home during his active years was at Butcombe Court on the edge of Broadfield Down. Locke notes that this was within sight of the turnpike road to Bristol, so that transport into the city some eight miles distant may have presented little problem²⁷. John Robert Lucas provides an example of a Bristol manufacturer who not only retained his business after acquiring landed property, but went on to develop both in harness. He was born in the mid-eighteenth century into a family making and exporting glass, for whom he at first worked in Bristol. In 1787 he began production in north Somerset, first at Stanton Wick near Chew Magna, at a

concern associated with the Adams family, then in 1788 on a new site at Nailsea where he leased five acres of land. In 1816 he gave up his links with the former and concentrated on Nailsea. As business prospered Lucas first leased a Tudor mansion in Wraxall, and then bought a hunting lodge on Broadfield Down which he converted into a richly furnished mansion surrounded by a large estate. Some land was rented from the Marquess of Bath and some was bought, including common land at Nailsea and Backwell sold to finance enclosure in the 1810s²⁸.

The parish of Stanton Drew from which Lucas withdrew offers a microcosm of the close relationship between Bristol and north Somerset under discussion. The Lyde family, successful Virginia and West Africa merchants, purchased an estate here to which to retire from the busy life in Bristol. A church monument says of James Lyde who died in 1731 that 'He was bred to merchandise in the city of Bristol, and followed that employment near thirty years with great integrity, reputation and success...he retired to his estate in this parish, where he spent the remainder of his days in tranquillity of mind and general esteem...' ²⁹. Also in this parish is the manor of Belluton, earlier the home of the Becher family of whom Cranfield was part-owner of a Bristol privateer in the 1740s, slave trader in the 1750s, and investor in gunpowder works in the 1760s and 1770s. He was a frequent correspondent of the M.P. William Dickinson who undertook financial transactions for him in London³⁰. But by the mid-eighteenth century Belluton had become the home of the Adams

family, glassmakers with a Bristol link, and coalmasters whose business success was sealed by marriage into the old family of Lyde. As they established themselves in the county the Adams began to appear in Commissions of the Peace, six being named as justices between 1757 and 1820³¹.

An attempt has now been made to show the closeness of the long-standing relationship between Bristol and north Somerset. The fact that Stanton Drew is not directly in Bristol's orbit but lies between that city and Bath, and that a similar account could be given of other parishes such as Woolley which is even further distant, to the northeast of the latter, shows how widely Bristol's influence extended. And it also ran deep, for the examples in this survey are not isolated cases but have been drawn from those parishes forming more than 28 per cent of the whole in north Somerset, for which there is strong evidence of a connection with Bristol through institutional links, landownership, or shared commercial ventures. The remaining parishes were also linked to Bristol but through the less specific ties of the movements of migrants and the exchanges of trade. The significance of this link is that it was part of and reinforced the trend in north Somerset away from the formality and conservatism of the traditional country gentlemen towards a recognition of individual spirit and enterprise. Bridging this gap were men with impeccable merchanting and

landowning credentials like Sir Abraham Elton, who was willing to defend the Bristol wholesaler deemed unworthy of the Bench, as being 'fully equal, if not superior to more than one Justice known to you and me'.

But the Bristol link must be placed in perspective, so other influences have to be mentioned briefly. Smaller urban centres like Bath exerted a power which mirrored that of Bristol, though to a much lesser degree. Here were markets for labour, food, fuel, and building materials, drawn from rural sources, and wealthy townsfolk found investment opportunities in surrounding parishes. Ralph Allen built his great mansion of Prior Park looking over Bath but not within its boundaries, and purchased land at Claverton and Bathampton which provided him with both country estates and raw materials in the form of building stone; William Wiltshire crowned his achievements as a carrier by buying the estate of Shockerwick and building a fine mansion there; and John Hooper of Walcot in that city bought the manor of North Stoke from the profits of his work as a financial broker, three cases which provide examples covering the whole period studied³².

Although most famous as a resort for distant travellers, Bath also provided a meeting place for the gentry, merchants, and clergy of north Somerset and Bristol. Common concerns could be aired, especially in bodies like the Bath and West Agricultural Society, founded in 1777 and widely supported as

its membership lists and journals show³³. Here progress and improvement could be discussed in both an abstract and a practical way in a forum attended by the gentry, clergy, men of science and medicine, and activists such as John Billingsley of Ashwick. This seemingly indefatigable 'improver' had risen from humble dissenting origins to become a clothier, landowner, improving farmer, enclosure commissioner, turnpike trustee, and canal and coal proprietor, as well as writing the report to the Board of Agriculture already mentioned, evidence for all of which activities comes from the documents studied, as the later chapters will show.

As the seat of a great bishopric and venue for Quarter Sessions Wells performed a different function, but it also provided a forum where the county could gather and discuss issues unconnected with official business. As an institution the Church exerted great power through the persons of the Bishops of Bath and Wells and the Deans and Chapter of Wells, who held the patronage of more than fifty livings in north Somerset as well as administering land owned by the Church in such parishes as Cheddar and Shipham. Their influence was supplemented by that similarly exercised by the Dean and Chapter of Winchester, the cathedral of Salisbury, and Oxford and Cambridge colleges such as Oriel, Balliol, and Emmanuel. Charities like St. John's Hospital in Bath and Sexey's Hospital in Brewton were also important institutional landholders in north Somerset, as was the Duchy of Cornwall.

There were thus many influences at play in north Somerset, some of a conservative nature, some encouraging improvements, but it seems likely that those exerted by Bristol merchants were the most important from the point of view of this study, because they were the most used to entrepreneurial enterprise and the most geared to creating economic change. However the progressive influences within north Somerset must not be overlooked, for they helped to create the context within which capital investment could take place. Before studying more closely the sources and employment of capital, the expertise of the enabling agents in the legal and banking professions will be considered next.

- 1 C.D.Ross, 'Bristol in the Middle Ages', in C.M.McInnes & W.F. Whittard eds., Bristol and its Adjoining Counties (1955), pp.179-92.
- 2 Ibid., p.182; E.M.Carus-Wilson, Medieval Merchant Venturers (1967), for a survey of Bristol's trade at this time, pp.1-98.
- 3 W.E.Minchinton, 'Bristol, Metropolis of the West in the Eighteenth Century', Trans.Roy.Hist.Soc., 5th ser.IV(1954), pp.69-89; The Port of Bristol in the Eighteenth Century (Br.Hist.Assoc., 1962); The Trade of Bristol in the Eighteenth Century (Br.Rec.Soc., 1957); Politics and the Port of Bristol in the Eighteenth Century (Br.Rec.Soc., 1963); P.McGrath, 'Bristol since 1497', in MacInnes & Whittard eds., Bristol, pp.207-218.
- 4 Minchinton, 'Bristol, Metropolis of the West', pp.73-7.
- 5 Peter T.Marcy, 'Bristol's Roads and Communications on the Eve of the Industrial Revolution, 1740-1780', Trans.B. & G.Arch.Soc., LXXXVII(1969), pp.149-72, esp.p.149, also Appendix pp.171-2 for inland carriers.
- 6 Minchinton, 'Bristol, Metropolis of the West', pp.82-5.
- 7 V.C.H.Somerset, II, pp.282, 294, 307-08; Barnes, Somerset, 1625-40, pp.10-11; Minchinton, 'Bristol, Metropolis of the West', p.75.
- 8 David Souden, 'Indentured servant emigration to North America and the case of mid seventeenth-century Bristol', in Peter Clark & Souden eds., Migration and Society in Early Modern England (1987), pp.155-64; the editors' 'Introduction' esp.pp.29-30, 37.
- 9 Souden, 'Indentured servant emigration', pp.151-2, 156; editors' 'Introduction', p.35; Peter Clark, 'Migrants in the city' in Clark & Souden eds., Migration and Society, p.283.
- 10 Harbin, Somerset Members of Parliament, p.194; Latimer, Annals of Bristol, II, p.183, notes the annual feasts held in the 1730s by Bristolians from Somerset to raise apprenticeships funds.
- 11 W.K.Jordan, 'Charitable Institutions of the West of England', Trans.Amer.Phil.Soc., new ser.50, 8(1960), pp.3-99. For criticism of this and other volumes see: G.E.Aylmer, Econ.Hist.Rev., 2nd ser.XV, 1(1962) pp.155-6; J.A.F.Thomson, 'Piety and Charity in Late Mediaeval London', Jnl. Eccles.Hist., XVI(1965); William G. Bittle & R.Todd Lane, 'Inflation and Philanthropy in England: A Re-Assessment of W.K.Jordan's Data', Econ.Hist.Rev., 2nd ser.XXIX 2(1976), pp.203-10; and the response entitled, 'Deflating Philanthropy', Econ.Hist.Rev., 2nd ser.XXXI, 1(1978), pp.105-28.
- 12 Jordan, 'Charitable Institutions of the West', pp.23, 33; Collinson, History of Somerset, II, pp.110-11, 207-09.
- 13 Jordan, 'Charitable Institutions of the West', pp.23-4, 30, 33, 38. The School was so well-endowed that marriage portions were

provided for former pupils. Whitson also benefitted the poor of Bristol and provided support for young merchants and craftsmen.

14 Elizabeth Ralph, Guide to the Bristol Archives Office (Bristol Corp., 1971), pp. 9-11, 42, for a survey of the city's real estate, especially that settled on Queen Elizabeth's Hospital; Jordan, 'Charitable Institutions of the West', pp. 37-8. Founded 1586 by John Carr, merchant and soap boiler of Bristol and London, the boys educated were to be natives of Bristol or Congresbury; Collinson, History of Somerset, III, pp. 144-5, 584-6, 593-6, 611-2.

15 These were at: Bathford, Portbury, Tickenham, Banwell, Churchill, and Rowberrow, Collinson, History of Somerset, I, pp. 111-16; III, pp. 144-5, 164-6, 566-8, 579-82, 599-600.

16 McGrath, Merchant Venturers of Bristol (Soc. Merch. Vent., 1975), pp. 208, 235, 352, 365-70; Little, Bristol, pp. 182-6.

17 Collinson, History of Somerset, III, pp. 599-600; Jordan, 'Charitable Institutions of the West', p. 73; McGrath, Merchant Venturers, pp. 167-9; W.R. Chaplin, 'The History of Flatholm Lighthouse', The American Neptune, XX (1960), pp. 5-43.

18 William Symmer became a member of the SMV in 1737, Minchinton, Politics and the Port, p. 213; he was a customer of the Old Bank in 1750 and possibly a partner in the Exchange Bank 1766-74, G.H. Cave, Banking in Bristol (Bristol, 1899), pp. 46, 86; in the Somerset Commissions of the Peace from 1749 to 1766, qualifying in 1753 on possessions in the parish of Rowberrow; one of four 'lords farmers' of the manor of Stogursey, Minchinton, Politics & the Port, pp. 203-04, an estate later to cause the SMV problems about ownership, McGrath, Merchant Venturers, pp. 367-70.

19 The Days held the manor of Burnett under the Mayor and Corporation of Bristol. Collinson, History of Somerset, II, pp. 415-6; Latimer, Annals of Bristol, II, pp. 144, 206; Samuel Day was in Commissions of the Peace 1787 to 1801, qualifying in 1791 on grounds of this estate, and property in Englishcombe and East Harptree.

20 Latimer, Annals of Bristol, II, p. 351, records Samuel Worrall's purchase in the 1770s of the profitable great and small tithes of the Bristol parish of Clifton, and this may have been when he also leased the rectorial interests of Congresbury. Collinson, History of Somerset, III, pp. 584-6, additional notes by Locke.

21 Collinson, History of Somerset, III, pp. 139-40, 614-5. Both cases come from Locke's notes and so refer to the later eighteenth and early nineteenth centuries.

22 Ibid., III, pp. 169-71, with note by Locke. It seems likely that the estate was leased from the Earl Poulett.

23 See Ivor P. Collis, 'Lease for a Term of Years Determinable with Lives', Jnl. Soc. Archivists, I, 6 (1957), pp. 168-71; and Clay,

'Lifeleasehold in the Western Counties of England 1650-1750',
Agric.Hist.Rev.,29,2(1981),pp.83-96.

24 Arthur & Margaret Ann Elton,Clevedon Court(National Trust, 1979); Collinson, History of Somerset,I,p.20,II,pp.320-22,III, pp.127,166-9; also books by Latimer,Cave,Minchinton and McGrath.

25 For the early history,see Jean Vanes,The Ledger of John Smythe 1538-1550(1974) and J.H.Betty,The Rise of a Gentry Family c.1500-1642,The Smyths of Ashton Court(Br.Hist.Assoc., 1978).Also Collinson,History of Somerset,I,p.78,II,pp.280-85, 288-305,369-71,III,p.578,579-82,590- 01. In the period of research lands were held in Long Ashton,Bedminster,Christon near Banwell,Churchill,Compton Dando,Farmborough, and Hutton.

26 Information on the Dickinsons comes largely from papers in the SRO.See also Collinson,History of Somerset,II,pp.80-3. After holding several borough seats, William I was county MP from 1796 to 1806,being succeeded by his son William II from that year to 1831,Harbin,Somerset MPs,pp.197-9.

27 Collinson,History of Somerset,II,pp.101-3,313-6,with notes by Locke;Cave,Banking in Bristol,pp.119-22.Savery was named in Commissions of the Peace from 1787 to 1820.

28 Collinson,History of Somerset,III,pp.162-3; Margaret Thomas, 'Agriculture and Industry in Nailsea,1780-1880'(unpub.M.Phil., Univ.of Bristol,1986),pp.79-80; enclosure awards at the SRO.

29 Collinson,History of Somerset,pp.432-8; Minchinton,Trade of Bristol,pp.101,152, and Port of Bristol,pp.10,21.

30 For example SRO,DD/DN,238/1-5, correspondence between Cranfield Becher and William Dickinson M.P. about the purchase of annuities in early months of 1779.

31 Collinson,History of Somerset,pp.432-8.The Register of Justices shows all qualified on property in the Stanton Drew area.

32 Benjamin Boyce,The Benevolent Man,A Life of Ralph Allen of Bath,(Harvard,1967). Allen served as a Somerset Justice from 1749,and an alderman of Bath from 1757,until his death in 1764; William Wiltshire undertook public responsibilities from the 1770s,as mayor of Bath in 1772 and 1780, and a Somerset Justice from the Commission of 1775 to 1787;John Hooper's land purchase took him into county life after the turn of the century, and he was named a Justice from 1801 to 1820.See also Collinson, History of Somerset,vol.I,pp.111-16,116-9,134-6,145-50.

33 K.Hudson,'Membership of the Bath and West Society',Acta Musaeorum Agriculture,XII(1978),pp.50-6. The Society's Journals are housed at the University of Bath.

Chapter 5 The Legal and Banking Professions in North Somerset.

In the period under review, professional men from a number of specialisms played an important part in the process of capital investment in north Somerset¹. These ranged from the clergy and medical men who invested small sums in local undertakings and became involved in the administration of public bodies like the turnpike trusts and improvement commissions, to the surveyors who were closely involved in the work of planning and construction which formed such an essential part of economic change. In view of the importance of this practical contribution a register of surveyors working in the region has been drawn up, based largely on lists edited by Peter Eden², supplemented by additional information from documents studied. This shows that in the years concerned, 50 surveyors were at work in north Somerset and 37 in Bristol, though to these should be added some of the 109 based in the rest of Somerset, who may have worked as much in the northern third as in the rest of the county. But even more important than these were the attorneys and bankers who acted as enabling agents in the process of capital investment, functioning as financial intermediaries between the supply of and demand for credit and capital, and as advisors and agents to those undertaking economic developments. In this last chapter on the context of capital investment in north Somerset, the work of attorneys and bankers will be examined against the background of registers listing those engaged in these professions.

Attorneys became established in Somerset from an early date in response to the legal business generated by its long-standing wealth, and large population relative to other counties. As early as 1422, Somerset men acting for others in the legal sense were described as attorneys³. From this background there had developed by the second half of the eighteenth century a body of local attorneys large enough to meet the increasing demand for their legal services, and with enough professional awareness to form the first and third earliest provincial law societies, for Bristol in 1770 and Somerset in 1796⁴. Law Lists are not available for 1770, but that for 1777 reveals there were then 35 attorneys in Bristol and 32 in north Somerset plus 25 in the rest of the county. By 1796 there were 73 in Bristol and 70 in north Somerset plus 101 in the rest of the county⁵. These figures suggest a doubling or more of active lawyers in the busy port and its hinterland in the years when the provincial societies were being formed, and a quadrupling in the rest of Somerset.

Over the longer period from the 1770s to the 1820s the patterns for Bristol and north Somerset continued to be similar, suggesting that although in terms of population the former was better supplied with attorneys than the latter, if seen as an economic indicator the two appear comparable. But with a three-fold increase in Bristol and slightly more in north Somerset, the divergence from the rest of the county with its five and a half-fold rise had become greater. This is in

part a reflection of a lower provision at the earlier date, but it also suggests that in the port and its hinterland the new demands for attorneys to act for commercial and manufacturing ventures as well as for public bodies and private individuals, may have been met by an increasing specialization of function rather than a simple increase in numbers. This crucial phase of development was captured by W.J.Reader when he observed that 'Inside the eighteenth century attorney half a dozen later professional men - the accountant, the land agent, the company secretary, and others - were struggling to get out'⁶. Amongst these, the role of the financial intermediary was particularly important because this was the specialism which could nudge the attorney into becoming yet another type of new professional, the country banker.

The importance of investment channels for bringing together the supply of and demand for capital and credit has received growing attention since the pioneering work of L.S.Pressnell on country banks published in 1956, which traced their development through the specialization of financial techniques already practised by goldsmiths, industrialists, remitters of funds to London, and money scrivenors whose work was absorbed by attorneys in the second half of the eighteenth century⁷. Like this study, that by Robert Robson on the attorney in eighteenth century England, of 1959, has not been superseded, though it has been complemented by later work⁸. Both B.L.Anderson and Michael Miles have studied the developing capital markets of

the eighteenth century for Merseyside and the West Riding respectively, but neither provides a satisfactory account of the attorney as a financial intermediary, for both argue from a few cases with no assessment of typicality especially in terms of the overall size of the profession, and little evidence is given of the provision of capital for business rather than private purposes. Anderson writes only of the mortgaging of a glasshouse 'presumably for the purpose of financing its early growth', and although Miles refers to 'money being borrowed for direct industrial investment', only one example is produced⁹.

The first deficiency can be remedied without too much difficulty for some information is available on the number and distribution of this budding profession. Regulation of entry, that mark of a profession, was introduced in 1729 by Act of Parliament which decreed that after a five-year apprenticeship attorneys were to be examined, take an oath, and be enrolled. 'Lists of Attornies and Solicitors' presented to the House of Commons over the years 1730-31¹⁰ form a useful preliminary to the Law Lists compiled from the mid-1770s. But the Returns of 1730-31 must be used with caution because of the problem of duplication which is evident when names are sifted to form a register. It becomes clear that the basis of compilation ensures over-counting, for lawyers could be enrolled separately in four Courts: the common law Court of Common Pleas, the King's Bench, the Court of Exchequer, and the equity-based

Court of Chancery. In Bristol and north Somerset this gave rise to 226 entries by 114 attorneys in 1730-31.

Once sorted out this confusion is seen to hide a great opportunity not provided by the Law Lists, of discovering attorneys' preferred areas of work. The Court of Common Pleas for example dealt with all kinds of disputes between citizens, and Birks has stated that the Returns of 1730-31 show that the majority of attorneys still belonged to it. But although in north Somerset 57.1 per cent did so, in Bristol the figure was only 15.4 per cent. In contrast 78.5 per cent of Bristol's attorneys were enrolled at the King's Bench which dealt increasingly with matters of commercial law (providing some evidence of the specialization already suggested). Yet Birk generalizes that numbers here were still 'relatively few', a comment borne out for north Somerset by the lower rate of 28.6 per cent. Of the other Courts, the Exchequer, formerly confined to disputes about royal revenue and now open to all common law actions, but unpopular because its proceedings were expensive, attracted the low enrolment of 18.4 per cent of north Somerset attorneys and 40 per cent of Bristol's. In contrast 80 per cent of attorneys in north Somerset and 73.5 per cent of those in Bristol registered in the Court of Chancery, perhaps due partly to the new creation in 1729 of the title of solicitor in Chancery, and partly to the perception that equity business was conducted in a superior way by gentlemen of high ability and

social standing, a view which led to the gradual appropriation of the title solicitor by attorneys¹¹.

Amongst attorneys in north Somerset the most common combination in 1730-31 was the Courts of Common Pleas and Chancery, though sometimes only the former. James Wickham of Frome is an example of the unremarkable men who undertook this basic legal work and are interesting chiefly for the niche in local society filled by them and their families. The only evidence of his work comes from the enclosure award for Doultling and Stoke St. Michael for which he acted as clerk and agent in 1775-6. According to the Law Lists he had by 1777 been succeeded in Frome by John Wickham. By 1787 there was another James, partnered from 1790 to the end of the century by a James Anthony, who then practised alone until at least 1812. Clerics in the family were Justices of the Peace from the 1760s, in which decade the only unusual note is struck, for the Rev. John Wickham then made three loans to the Percival & Copper Company, totalling £1,000¹².

Amongst attorneys of Bristol in contrast, the most frequent combination in the Returns was the Courts of the King's Bench and Chancery, with four out of ten also joining the Court of the Exchequer. An example of the more ambitious men who developed their role beyond that of the prosaic general legal work is provided by George Tyndale. By 1730-31 he was already established as an attorney in Bristol. He became a partner in

the Exchange Bank when it was set up in 1764 as Bristol's third such institution, in a move which marked not so much a change as a development of his career. Evidence of Tyndale's continuing involvement with his original business is shown by sales of property in 1762, conveyancing in 1765, and complaints on behalf of clients about quarrying in 1770. This association with the affairs of local people must have made him a valuable asset to the Bank where, by the terms of the partnership agreement, both banking and conveyancing were undertaken. But the Bank was more adventurous than this suggests, for in 1764 a loan of £3,000 was made to the Percival & Copper Co. Tyndale's association with the Bank had ended by 1775, and he does not appear in the Law List of 1777¹³. Unlike the Wickhams of Frome there was no legal dynasty of Tyndales in Bristol.

As well as indicating the type of work undertaken, the Returns of 1730-31 also provide evidence on the distribution of attorneys in the region. In this respect they offer a valuable bench mark, for they reveal a pattern which can be observed in north Somerset throughout the period studied. About 75 per cent were based in the towns of Axbridge, Bath, Frome, Shepton Mallet, and Wells, with the remainder at smaller settlements. Of the towns the old market centre of Axbridge had the smallest number, with two in 1730-31 rising to eight at the end of the century, falling to five in the 1820s. The woollen towns of Frome and Shepton Mallet had six each in 1730-31, but whilst the former had ten in in the 1820s, the latter showed no

increase, perhaps confirming the decline already noted. Bath and Wells were also in comparable positions in 1730-31, the former having ten and the latter eleven attorneys. Despite an increase to fifteen in the first two decades of the nineteenth century the overall rise at Wells was to thirteen, suggesting that the judicial, church, and county business there had increased little. But the number in the rapidly-expanding city of Bath with its many wealthy visitors, had more than quadrupled to 44 in the early 1820s.

The position in the rest of north Somerset is more difficult to sum up, for at some time in the years between the 1730s and the 1820s, 45 settlements had resident attorneys, with only the manufacturing centre of Keynsham between Bristol and Bath being served over the whole period. The agricultural settlement of Wrington sustained two or three from the 1770s. Chew Magna, Leland's 'pretty cloathing townelet', had an attorney briefly in 1730-32 but then none until the revival of its fortunes on an agricultural basis, when it had one in the 1790s, two by 1817, and four in the 1820s. In the many villages ranking below these three 'townelets', changes in the provision of attorneys give a similar indication of fluctuating economic fortunes especially as the woollen industry declined in the east and the newly enclosed and drained lowlands in the west assumed a greater importance. Apart from an occasional service in later years, formerly-prosperous woollen cloth markets such as Beckington near the Wiltshire border lost their attorney after the 1770s,

whilst newly-prosperous agricultural centres like the recently enclosed and drained Congresbury in the west of the region acquired this facility for the first time in the early nineteenth century. Another development was the acquisition of attorneys by villages near Bristol and Bath, such as Long Ashton and Batheaston respectively from the 1780s. The needs of mining centres were met belatedly, as at Midsomer Norton in the second decade of the nineteenth century, but perhaps the agreements on partnerships and access to land which underpinned mining concerns were drawn up by attorneys already employed on traditional estate business. Lastly, although the proportion of north Somerset attorneys at work in the countryside remained the same their numbers increased in response to the general growth in economic activity, with the result that double the number of villages served in the 1730s had this provision in the 1820s.

The recurrence of family names amongst these village attorneys shows that social factors as well as economic ones influenced their location. In the agricultural village of Ston Easton for example, where there was opportunity for work on enclosures, William and Thomas Miles were in partnership from 1789 to 1797. Having settled there the latter then continued on his own into the 1820s¹⁴. Insight into professional training in these circumstances comes from Robson's chance citation of a Somerset example of apprenticeship terms, set out in 1820 by William Leigh of Bardon near Taunton. The need for hard work, a good

hand, membership of the Established Church and a premium of 600 guineas are all stressed, as is the fact that the young man would enter an office consisting of a managing clerk, a writing clerk, and an articled clerk who was Leigh's son¹⁵. The organization of a legal practice in the Somerset countryside was thus no mean undertaking. The Law Lists show that at different and overlapping times Robert, William, and Henry James Leigh were attorneys in Bardon.

It has been suggested that the development by attorneys of their non-court activities was a response to the success of the Bar in excluding them from the more lucrative branches of legal practice¹⁶. But from the evidence studied it seems more likely that it was the small part played by the central administration in regulating the burgeoning economic activity in the regions, which created openings for local agents to organize the legal framework needed to accommodate the processes of change. This suggestion may be supported by reference to the many documents relating to schemes for enclosure and drainage, turnpikes and canals, and urban improvements, surviving for this region. Attorneys devised appropriate legal forms for those bodies requiring legitimation by private Acts of Parliament, and also developed the financial instruments through which they could be funded. Though not requiring the formalities of legislation both manufacturing and mining ventures depended on the drawing up of partnership agreements by local attorneys, for like the public undertakings noted above, the establishment of property

rights was crucial to economic development. There is no indication that these newer functions were developed to the exclusion of more traditional work with private clients, which in any case brought its own advantages as attorneys were made privy to unrivalled information about the availability of private savings. In matching these to private and public demands for funds, attorneys became skilled financial intermediaries.

An effective combination of these private and public roles is to be found in the careers of a father and son whose work in Bath spanned eighty years. Philip George sr. was already active in the local capital market in 1781, when properties were conveyed to him in an effort to stave off the bankruptcy of John Wood. Philip George jr. was enrolled as an attorney in 1806. Both then pursued a private practice harnessed to a public career based upon the town clerkship of Bath, held in succession from 1800 until 1860. Similar roles were performed for the Bath Turnpike Trust and the Bath Improvement Commissioners. Their surviving correspondence reflects these varied strands for it concerns such matters as the letting of the Pump Room, the redemption of the Land Tax, and the exemption of Bath from the County Rate; as well as the affairs of for example the Elton, Day, and Dickinson families¹⁷. In raising funds from private clients for the institutions they served, such attorneys successfully extended the personal capital market. Even more importantly, by recruiting funds from

unknown clients for investment in public utilities such as the turnpike roads, through the development of what will here be referred to as the institutional mortgage, they also helped to create an impersonal capital market before the advent of canals promoted that facility¹⁸.

The practice of financing enclosures in north Somerset by selling land was another important factor in the development of an impersonal market¹⁹, in which local attorneys played an important role. Of the more than three dozen named in the enclosure awards, drainage plans, and associated papers, the majority, 42 per cent, came from small towns and villages in the region²⁰. A further 28 per cent came from Wells, but none from Bath which suggests that the former was more important in county matters, whilst the latter was absorbed in the affairs of town and visitors. Bristol provided the remaining 30 per cent of those involved, for some of the land enclosed and drained was close to that city, the investment possibilities were attractive, and several institutions had an interest in the properties involved, like the Corporation of Bristol whose attorney William Diaper Brice acted for them in Congresbury and Portishead, 1809-23. Samuel Baker may be cited as an example of an attorney who prospered through enclosures. His career had begun in Bristol in the early 1790s, but by settling in 1798 in Blagdon some nine miles south southwest of the city, where his family had property, he secured a good base from which to take part in this work for over two decades. He was involved in at

least twelve enclosures in that part of the region, in several of which he bought land for his clients or himself. He also worked on the Axe and Congresbury Drainage schemes. The pattern followed was a typical one, for by working with colleagues as clerk, umpire, witness, or even commissioner, Baker formed part of a self-sustaining network. When writing to the Parliamentary lawyer George White for example, Baker explained that he did so on the recommendation of his friend Mr Osborne of Bristol²¹.

Attorneys acting for long-established bodies sometimes had the difficult task of advising on the legality of new work not specified in the original terms of establishment. The advice of counsel was then sought, as in the early 1800s when John Conway, attorney in Wells from 1787 till 1819, and clerk to the Axe Division of the Court of Sewers, consulted Wyndham Goodden on such a point. This Barrister at Law of the Temple and Somerset justice from 1787, mentioned already in relation to his three sons, had a home in Bath where these consultations took place. The occasional presence of James Stephens shows the complicated context within which attorneys operated, for although Stephens had a house in Bath, his main residence was in Camerton where he was both lessor and partner in coalmining ventures, and one of his advisers on the legal aspects of coalmining from the 1770s was George Tuson, Conway's partner in Wells²².

Although urban attorneys were less likely to be involved as here with drainage or mining developments, they were more

influential in the promotion of bridges and canals and the growth of the building industry. Negotiations to improve Bristol Bridge began in 1758 and attorneys such as George Tyndale and Samuel Worrall were closely concerned with the Trust then set up. Bristol attorneys were also involved in canal finance, especially during the boom years of the early 1790s centred on this and other cities. For some such as Isaac Cooke who established himself in Bristol in 1792, this helped launch a career connected not only with canals, but also with housing speculations and the Congresbury Drainage Scheme. J.R. Ward has pointed out that Bristol's canal mania coincided with a building boom in the city, and that both are evidence of surplus capital seeking a profitable market.²³ As in Bath over the period studied, Bristol attorneys were involved in both the legal and financial aspects of building operations. Although a small number of attorneys went on to gain eminence as clerks to justices of the peace, religious and secular societies, corporate towns, and to the county itself,²⁴ it is likely that in these prestigious roles they had less influence over economic developments than their less notable contemporaries, now known to us only through the Law Lists and the chance survival of documents. Yet it is these more anonymous attorneys who helped to bring a new vigour to economic life by devising both the legal forms that enabled developments to take place and the financial instruments that made investment possible.

The view that the legal profession was one of the main groups from which bankers were drawn in these years has come to be widely held²⁵. Attorneys were certainly well-placed to make this move, which entailed a development from the role of financial intermediary balancing assets and liabilities, to that of credit-provider, issuing notes and money which constituted claims upon the banker and could be used in the settlement of debts. They were also able to balance a familiarity with their own locality against their links with London, maintained through agents who are shown by the Law Lists to have had long-standing associations with their provincial clients. But on the evidence of this region at least these attorney-bankers have gained an attention out of all proportion to the numbers involved. Thus a register of bankers in this region and in Bristol, drawn from available evidence, and matched against the register of attorneys drawn from the Law Lists, shows that only a small proportion of the former had legal origins. Of 129 bankers in Bristol in the period of this study, 5.4 per cent were attorneys, and of 85 in Bath the figure was 15.3 per cent. For north Somerset as a whole the proportion was around 17 per cent²⁶.

Furthermore the influence of the few attorney-bankers was limited to a small number of banks. In Bristol all but one were partners in the Exchange Bank, set up in 1764. Henry Bengough was the exception, and he became an original partner of the City Bank in 1794 the year after establishing himself as an

attorney in the city. Apart from the interest in conveyancing mentioned earlier, the work of the Exchange Bank did not differ noticeably from that of the other nineteen established in Bristol between 1750 and 1827 when a branch of the Bank of England was set up. Pressnell notes that apart from the accounts of the partners, their families, and business associates, most of their customers came from the city where many were merchants. By the later 1770s the Exchange Bank had connections with the West Indian trade, and in the following decade there was some lending on estates there. There were links with South Wales, for bills issued by a tin works in Cardiff were payable by them. In matters of banking practice, interest of 2 to 5 per cent was being paid at the end of the 1770s on money deposited for different periods, and there is also evidence of a willingness to lend at that time without security or collateral. A mixed bag of securities was revealed in 1811 when a woolbroker sought to extend advances already made to him. But by that time the first partners had died, and with them any claim the Bank had to a special distinction²⁷. Even the loans made by the Exchange Bank to the major copper company in Bristol do not show these attorney-bankers behaving differently from others, for each of the four banks established in the 1750s and 1760s made loans to Bristol firms working on manufacturing sites in north Somerset.

Many of Bristol's bankers had a mercantile background, and although the contribution of industrialists, money scrivenors,

remitters of funds, and goldsmiths to country banking has been well-recognized, that of the merchant traders has been less so²⁸. Yet in the port city of Bristol they and manufacturers provided the most significant part of the ~~the~~ necessary funds to launch the banks, the financial expertise to manage them, and the network of contacts to use the services provided. Their business life would have already familiarized merchants with systems of accounting, credit and insurance²⁹. The importance of the West Indian trades in Bristol was reflected in the number of sugar refiners who became bankers³⁰, to whom must be added distillers, drysalters, linen drapers, and partners in copper, brass and gunpowder works³¹. Some were not averse to a little profitable privateering³². Only three were goldsmiths, but they cover the period studied, for John Vaughan (the son of the 'Father of Bristol Banking') was a partner in a bank founded in 1752, Thomas Wigan in 1790, and Henry Browne in 1811. In Bath's 14 banks attorneys were relatively more important, but as in Bristol most bankers came from other backgrounds. Unlike the port city the merchants were inland traders, dealing especially in wine and brandy³³. Others were described as linen drapers, clothiers, builders, ironmongers, grocers, and silver and goldsmiths, thus encompassing much of urban life³⁴. Though still not preponderant, attorneys were more important as a source of bankers in the rest of north Somerset, especially through families such as the Paynes of Wells and Axbridge, and the Messiters of Wincanton and Frome.

The strength of Bristol's economic life meant that most bankers came from within this community, and the banks they founded had a remarkable longevity and stability. This was especially so before the last decade of the eighteenth century, after which some more dubious and short-lived banks were formed³⁵. Despite individual links with Bath banks, the Bristol banking establishment remained very self-contained until the Stuckeys of Langport formed a branch there in 1806, as part of a growing network which also included a branch at Wells in 1814³⁶. At Bath in contrast, the earliest banks of the 1760s and 1770s included partners from outside the city and had branches in, or were associated with, banks in the Wiltshire clothing towns of Bradford-on-Avon, Trowbridge, and Warminster³⁷. In 1809 the Bladud Bank of Bath, founded in 1790 by local professional and tradesmen and a supporter of the building industry there, was amalgamated with the Wells bank of Payne & Hope, founded in 1800 by a partnership which included attorneys of the Payne family³⁸. Despite this broader base the Bath banks displayed less continuity than those in Bristol, in both a personal and an institutional sense. None of those in Bath was associated with several generations of the one family as were for example the Miles and Harford Banks in Bristol³⁹, and although only one minor house out of eight in the port closed in 1793, two of the five in Bath failed then⁴⁰.

These differences in stability may also reflect the contrasting roles the banks played in the local economy, for

whilst those in Bristol drew upon the trading network of the port and gave financial support to businesses in the region, the basic task of those in Bath was that of serving local inhabitants and accommodating visitors to the spa. The Letter Book of a Newbury bank for example, shows that some visitors made preliminary arrangements to have sums placed at their disposal, whilst others like a Mr. Wroughton in 1790 were so credit-worthy they were 'very ready to Guarantee any Sum he may have occasion for during his stay'⁴¹. But this routine work must have made for dull banking, so some houses engaged in speculative support for the volatile local building industry and other uncertain ventures, which jeopardized their stability and led to the two failures of 1793. Both had had a well-established regional base, conveyed in the case of the Bath & Somersetshire Bank by its name. Founded in 1775 and known also as Messrs. Horlock & Anderdon⁴², this was one of the chief correspondents of the Newbury bank mentioned. The title of the other, the Bath City Bank set up in 1776, suggests a greater insularity but a review of the partners shows this was not so. Two of the originals were the Bristolians Samuel Peach a linen draper and Benjamin Loscombe a sugar baker, both already founding partners of a bank established in Bristol in 1774. After they had dropped out of the Bath bank in the mid-eighties it became known as Cross, Son & Bayly, but a Bristol connection was maintained through Thomas Wells of Clifton. The partners also traded in Wells and Bridgwater⁴³. The Bank was very successful in attracting small deposits and by 1789 these came

to nearly £200,000⁴⁴. But against this success must be set a naivety of management which allowed Cross & Bayly's position as claimants in a bankruptcy case to be compromised by the handing of a draught to another claimant⁴⁵, and a lack of propriety in business affairs which led to one of the partners losing the Bank over £27,000 in the early 1790s before bankruptcy caused trading to cease⁴⁶.

This survey has shown the network of professional expertise available in north Somerset in the period under review. Attorneys were well-distributed throughout the region, their numbers supplemented by those based in Bristol. For a study of capital investment their significance lies in their skill in devising both the legal forms that enabled economic developments to take place, and the financial instruments that made investment possible. They were enabling agents, and as such they played a particularly vital role in the development of a public capital market, as will be seen. Their connections allowed them to play a small but important role in the development of banks. They had useful links with London through their agents there, but even more importantly, they had an unrivalled knowledge of local society. It was said of Mr. Moulton Messiter of Wincanton in 1780 for example that he was both 'The most eminent attorney in this county and acquainted with all the monied people in it'⁴⁷.

A survey of bankers has however shown that most of them were not lawyers, but came from a wide range of other backgrounds. Many in Bristol were merchants, which was a source of strength that led to the development of links with manufacturing ventures, and later with public undertakings. In contrast the Bath banks were less supportive of sound business initiatives within the region, and also less successful in securing public work. It was for example Messiters, Payne & Hope of Wells who became bankers to the Axe Drainage Commissioners, and the Bristol banks of Ames, Bright & Co., and Miles, Vaughan & Co., who held that position for the Congresbury and Weston Drainage Commissioners respectively. And any account of the part played by banks in the process of capital investment must also take into account their entire lack of involvement in some aspects of economic life such as the financing of turnpike trusts, at least until the early nineteenth century.

1 The term professional is used to signify those following a calling which required an expertise through training; conferred entry upon a restricted group; and distinguished its members from the leisured, trading, and labouring interests. Evidence is largely based on Returns for 1730-1 and Law Lists from 1777.

2 Peter Eden ed., Dictionary of Land Surveyors and Local Cartographers of Great Britain and Ireland 1550-1850, Part I(1975), Part II(1976), Part III(1976), Supplement(1979).

3 Michael Birks, Gentlemen of the Law(1960), p.28; Harry Kirk, Portrait of a Profession. A History of Solicitors(1976).

4 Robert Robson, The Attorney in Eighteenth-Century England (Cambridge, 1959), pp.36-8, 166-7, App.4; Bristol Law Society, The First Two Hundred Years(Bristol, 1970).

5 A Register of Attorneys for this region has been drawn up from copies of the Law Lists at the British Library. Coverage is good, though some volumes are missing and in some years they were not published. See Browne's General Law List, 1777-97; Hughes' New Law List, 1798-1806; Clarke's New Law List, 1806-.

6 W.J.Reader, Professional Men. The Rise of the Professional Classes in Nineteenth Century England(1966), p.27. Quoted by Victor Belcher, 'A London Attorney of the Eighteenth Century: Robert Andrews', London Journal, 12, 1(1986), pp.40-50.

7 L.S.Pressnell, Country Banking in the Industrial Revolution (Oxford, 1956), esp. 'The Origins of Country Bankers'. Birks, Gentlemen of the Law, pp.82-5, shows how the work of scrivenors, investment brokers from the end of the sixteenth century, was taken over by attorneys and then bankers. The Stamp Act of 1804 excluded the scrivener from his craft unless also an attorney.

8 Like that by Philip Aylett, 'Attorneys and Clients in Eighteenth-Century Cheshire: A Study in Relationships, 1740-1785', Bull. John Rylands Lib., 67(1987), pp.326-58.

9 B.L.Anderson, 'The Attorney and the Early Capital Market in Lancashire', in Crouzet ed., Capital Formation in the Industrial Revolution, pp.223-55, esp.p.230; M.Miles, 'The Money Market in the Early Industrial Revolution: The Evidence From West Riding Attorneys', Bus. Hist., 23, 2(1981), pp.127-46, esp.p.133.

10 The Returns are in Sheila Lambert ed., House of Commons Sessional Papers of the Eighteenth Century(1975), vol.13, 'Lists of Attornies and Solicitors Admitted in Pursuance of the late Act (2 George II, c.23)', pp.1-290. For brief accounts of this attempt at regulation see Robson, The Attorney, pp.8-12; Birks, Gentlemen of the Law, pp.135-40; and Kirk, Portrait of a Profession, pp.72-3

11 Birks, Gentlemen of the Law, pp.142-4.

12 Collinson, History of Somerset, II, p. 373, with note by Locke; SRO, Enclosure Award, Q/RDe 58, 1775-6; BRL, 'Committee Book of the Joseph Percival & Copper Company', 1762-9. The Rev. John Wickham made three loans: 1764, £400 for 12 months at 5 per cent; 1765, £100 and £500 for 3 months at 4 per cent.

13 Collinson, History of Somerset, I, pp. 113-16; Cave, Banking in Bristol, 85-9; McGrath, Merchant Venturers of Bristol, pp. 188, 194. McGrath spells the name Tyndall, but this confuses the attorney-banker with a Bristol merchant family; BRL, 'Comte. Bk. Copper Co.'

14 SRO, Q/RDe, 81, 1793-5; 23, 1797-1800; 65, 1794-6. William Miles purchased land in enclosures at Wells and Chewton Mendip, probably for clients, and Thomas was a witness at East Harptree.

15 Robson, The Attorney, pp. 157-8; Law Lists.

16 Birks, Gentlemen of the Law, p. 198.

17 Neale, Bath, p. 164; BGA, papers of Philip George and son.

18 See Buchanan, 'The Evolution of the English Turnpike Trusts' for the operation of the institutional mortgage.

19 See Buchanan, 'The Financing of Parliamentary Waste Land Enclosure' for a study of land sales.

20 Most attorneys taking part in enclosures were based in Axbridge, Blagdon, Chewton Mendip, Frome, Long Ashton, Portbury, Ston Easton, Wedmore, and Wrington.

21 From the late 1790s to 1820 Samuel Baker took part in enclosures at Banwell, Clevedon, Congresbury, Dundry, Kewstoke, Locking, Long Ashton, Portbury, Tickenham, Uphill, Weston-super-Mare, Worle, and the combined parishes of Wraxall, Nailsea and Flax Bourton, purchasing land at the first four and last of these. WSS, L0235, S/W17/43, Samuel Baker's Letter Book, copy of letter to George White esq., 17 Nov. 1792, on Kewstoke enclosure.

22 SRO, Axe Drainage, Box AD3, expenses for journey to Bath, 1808; Collinson, History of Somerset, III, p. 331; Down & Warrington, Somerset Coalfield, pp. 112-3; SRO, DD/MGG Box 2, contains a Declaration of Trust of 1773 that the purchase of land by George Tuson had been on behalf of Messrs John Mogg and others, coalmasters.

23 Pressnell, Country Banking, pp. 39, 374-5; BRL, Mins. of Bristol Bridge Trust; Aylett, 'Attorneys and Clients', p. 356; McGrath, Merchant Venturers, p. 186, refers to the Society's approval in 1792 of 'a change of plan for Mr. Isaac Cooke's crescent'; J.R. Ward, The Finance of Canal Building in Eighteenth-Century England (Oxford, 1974), pp. 92-4, 138-40, and his 'Speculative Building at Bristol and Clifton, 1783-93', Bus. Hist., XX, 1 (1978), pp. 3-18.

24 For example: Thomas Fane was Stamp Distributor and Clerk to the Soc.Merch.Vent.until enobled in 1757; Jarrit Smith was M.P. for Bristol from 1756 to 1768; and Samuel Sandelands Rogers was Clerk to the Dean and Chapter of Bristol in the later 1820s.

25 Pressnell,Country Banking,pp.36-44;Robson,The Attorney,p.112

26 Cave's Banking in Bristol provides an excellent base for the subject there; Philip Ollerenshaw's account of 'The Development of Banking in the Bristol Region,1750-1914',in Harvey & Press eds.,The Business History of Bristol(Bristol,1988),pp.55-82,is largely concerned with the growth of joint stock banking after the period of this research.Sources for Bath are limited though they include a short article by A.G.E.Jones,'The Banks of Bath'Notes and Queries (1958), pp.277-83. Information on the rest of north Somerset has proved most difficult,though Pressnell & Orbell,Guide to the Historical Records of British Banking(1985) has provided clues.

27 The original attorney-partners of the Exchange Bank were Messrs.Tyndale,Swymmer,Worrall,Hale and Newman; Cave,Banking in Bristol,pp.85-9,126-31; Pressnell,Country Banking,pp.41-3,47-51,79-80,252,289-91, 299-301,307,501-2, App.7,520.

28 Pressnell,Country Banking, pp.12-14; see also,B.L.Anderson, 'Financial institutions and the capital market on Merseyside in the eighteenth and nineteenth centuries',in Anderson & Stoney eds.,Commerce, Industry and Transport. Economic Change on Merseyside(Liverpool,1983) pp.33-4.

29 Local sources from which Bristolians received advice included.The Marchants Avizo by I.B.,ed.McGrath(Harvard,1957,1st pub. 1589),and Jones' English System of Book-keeping,ed.B.S.Yamey (1978,1st pub.1796). Richard Brown,A History of Accounting and Accountants(Edinburgh,1905),observed that in 1793-4 there were 25 professional accountants in Bristol, but only 11 in London.

30 Examples include: Edward Brice of Frenchay(1767-1833), original partner of Birch, Pitt & Co. 1808-1833; James Ireland of Brislington,original partner of Bristol City Bank 1794-1815; Andrew Pope(1774-1832), original partner of Bristol Tolzey Bank 1808 to 1819 when it stopped payment; Morgan Smith, an original partner of Vaughan & Co.(later Miles Bank) 1752-1781.

31 Examples include: Levi Ames, drysalter, original and senior partner of Ames, Cave & Co. 1786-1800, when he retired and his son of the same name joined the Bank;Samuel Peach of Tockington (1715-85), linendraper, original partner of Peach,Fowler & Co., 1774-1781, and original partner of Bath City Bank,1776-1784; Samuel New (later Birch,1763-1846), brass manufacturer, partner in Miles Bank 1794-1808, leaving to help set up new bank of Birch, Pitt & Co., from which he retired in 1819.

32 The Tryall privateer was owned by Henry Bright and Jeremiah Ames in the 1760s, original partners in the Harford Bank set up 1769. Bright was a West Indian merchant who died in 1777 leaving a fortune of £50,000; Ames was a partner in the Littleton powder works and died in 1776 leaving £70,000. See Minchinton, Trade of Bristol, pp.36-7,45; Cave, Banking in Bristol, pp.90-1; Latimer, Annals of Bristol, II, p.462.

33 Isaac de Vic, brandy merchant, 'open'd a Bank' for remitting money between London and Bath, Bath Journal, Sept.24, 1753. Other wine and brandy merchants included the following partners in the Bladud Bank, established 1790: Thomas Collett sr. 1790-1809; succeeded by his son of that name; Samuel and Robert Fa(u)lkner, 1820 to 1826 and 1835 respectively; and William Stroud 1809-15.

34 The bank founded by linen drapers Robert and William Clement in the 1760s became the High Street Bank in 1783, later to be known as Clement & Tugwell until almost 1830. Other examples include John Giles, builder and dealer; William Harris, tallow chandler and ironmonger; William Kemp, grocer and tea dealer; and James and William Evill, jewellers and silversmiths, bankers in Bath from 1814 until leaving the city in 1834.

35 These included Jane, Wigan & Heaven, 1790-93; the Bristol Commercial Bank, 1804; Lewsley, Webber & Wilcox, Spanish woollen traders, 1807-09; and a Commercial Bank of 1820 which sought to help the 'many merchants and tradesmen whose small accounts are not' welcomed by major banks in Bristol, Cave, Banking, pp.165-7.

36 Ollerenshaw, 'Development of Banking, pp.58-9.

37 For example the Bath (later Old) Bank, established 1768 included amongst its original partners the clothier Samuel Cam of Cam, Hillier & Bush of Bradford-on-Avon, and the attorney Daniel Clutterbuck of the same town. It had branches there and in Trowbridge. From 1796 the partners were joined by Benjamin Hobhouse (later knighted), son of the Bristol merchant John Hobhouse and son-in-law of Samuel Cam; the partners of the Bath & Somersetshire Bank set up 1775 included Isaac Webb Horlock of Ashwick in north Somerset and Joseph Mortimer of Trowbridge, both also partners in the Warminster bank of Horlock, Everett, Mortimer & Everett. Jones, 'Banks of Bath'; BaRL, Sydenham Scrapbooks.

38 SRO, Wells Mus. MSS, DD/WM, 1/351, Articles of Co-partnership for 21 years in the business of banking, 21 Sept. 1809, between partners in Bath and Wells. Dissolved in 1825 (DD/WM, 1/441). The Wells Bank of Payne & Hope became bankrupt 1831 (DD/WM, 1/438).

39 Edward Harford was an original partner of the bank founded in 1769, and the Miles family became associated with that taking their name in 1794. In 1820 they amalgamated as Miles, Harford & Co.. In 1877 they joined the Old Bank, Bristol's first, founded in 1750. Cave, History of Banking, pp.65-84, 90-9.

40 Chatham Papers PRO,/30/8/274. 7 March,1793: Mr.Cross,banker of Bath, failed for more than £1,200,000; Messrs.Horlock & Anderdon, bankers of Bath, failed for more than £600,000; and Thos.Wigan, banker of Bristol, failed for more than £30,000.

41 PRO,Chancery Masters' Exhibits,C 171/20. Letter Books of Vincent, Bayly & Vincent, bankers of Newbury.

42 Neale refers to the involvement of this bank in the developmmnt of the Bathwick estate under the mistaken name of 'Sherlock' & Anderdon, Bath,p.239.

43 Cross & Bayly's bankruptcy papers refer separately to those accounts in the Bath books and those in the Wells, and meetings of creditors were held in both cities, BaRL, Sydenham Papers, p.323. In Nov.1791 Messrs.Cross & Baily had joined with other partners to form the Bridgwater Bank of Cross, Sealey & Co., which survived the failure of the Bath City Bank, Pressnell, Country Banking,p.337.

44 PRO,B1/89/fol.53 & fol.220,1794. Small savers making claims against Cross & Bailey included widows and a glassmaker from Bristol; a grocer and shoemaker of Bath; and a Wiltshire farmer. All had made deposits of up to £800 @ 3½%.

45 PRO,B1/82/fol.223,1792. Cross & Baily petitioned against the bankrupt Henry Mais to whom £400 had been loaned on a promissory note backed up by a plumber, Thomas Chilton of Bath. John Cooke the managing clerk had allowed the latter to present the draft to the Bankruptcy Commission, who then refused the Bank's own claim.

46 PRO,B1/88/fols.113,114 & 295-7. In 1791 James Cross of Cross & Baily had entered into an agreement with James Rogers of Bristol, merchant and chapman, to deal in Manchester cotton. Their business was brought down in the mercantile crisis of 1793, with Rogers owing the Bank £27205.19.10d on the backing of 27 promissory notes dated 20 Feb.1793. Rogers failed for more than £500,000.

47 Robson,The Attorney,p.153.

Part III Capital Investment in North Somerset, 1750-1830.

Chapter 6 Capital Investment in Agriculture

Within the context now established, the process of capital investment will be examined in the following chapters through cases drawn from agriculture, mining, manufacture, and transport in north Somerset. In the first of these, a study of agricultural investment, attention is focussed on the following three aspects of the subject: enclosure, by which the system of cultivation was transformed from the traditional and corporate method of farming in common to the modern and individualistic one of farming in severalty; drainage schemes, undertaken in the lowlands; and soil reclamation and farm making. These were all of economic significance for they led to a growth of physical capital in terms of space and time, in what was otherwise a fixed natural resource, the land. In the Mendips for example, enclosures enabled the rough wastes to be brought under the plough in the closing decades of the eighteenth century, and in the Levels enclosure and drainage schemes from the turn of the century extended the use of the previously inundated lands from half to possibly a full year. Through the re-organization of land holding and the re-forming of the physical assets of farms in terms of new walls, roads, and drains, enclosures in these and other parts of north Somerset also paved the way for an investment in improved methods and

equipment which permitted a greater efficiency in agriculture, and an increased value in land.

To contemporary enthusiasts for improvement such as John Billingsley, enclosures were also seen as a way of working upon the human capital involved in farming. Farmers who had proved resistant to the spread of scientific methods, and who were as he wrote 'much bigotted to old customs'¹, had to meet the challenge of the new framework for farming resulting from enclosure, for unlike the ideas propogated by agricultural societies and individual reformers, these procedures were legally authorized and could not be ignored. Opposition was expressed in petitions to Parliament and by the tearing down of fences², but the enclosure of the north Somerset waste lands was less likely to lead to a class of landless labourers than that of the open fields, for many receiving allotments in lieu of common grazing rights were often already pursuing other crafts, so the few acres allotted were more likely to be an additional than a sole source of support for a family³.

Studies of the economic aspects of enclosures, like those of social costs, have tended to focus on the open arable fields⁴. In the contribution by Holderness to the Studies in Capital Formation for example, figures for the acreage of waste land reclaimed and enclosed in 1770-1860, and the unit cost of this investment, are based upon the area enclosed by Act of Parliament plus that reclaimed by private enterprise, with no

allow~~ance~~ for the large Parliamentary drainage schemes which were separate from both⁵. This suggests the exclusion of the three catchment areas of north Somerset, for which comprehensive drainage plans were authorized by Acts of Parliament. This neglect will be remedied by the following review of Parliamentary enclosure and drainage, and other post-enclosure costs.

i The Financing of Parliamentary Enclosure.

In the period studied some 42,000 acres of waste land were enclosed in north Somerset, together with a relatively small amount in open fields, possibly 1,000 acres. The different farming areas have already been described: the uplands, especially the Mendips but also its outliers and the southerly extensions of the Cotswolds; the Levels, along the coast from Uphill towards the mouth of the Avon, and inland by the river valleys; and the undulating lands between the northern slopes of Mendip and the River Avon. In the mid-eighteenth century both uplands and lowlands were largely unenclosed commons or waste lands, the former used for sheep pasture and the latter for cattle grazing. But the fertile red marls and sandstones, the only area where the open field form of cultivation was ever extensively practised, were to a large degree already long enclosed and attuned to the market economy provided particularly by Bristol and Bath. The timing is difficult to

~~difficult~~ to determine, but by the sixteenth century the extent of enclosure by agreement may have helped prevent agrarian disturbances, and the resulting boundaries led to a call for caution in the Civil War, 'Lest we engage our body of horse too far into that enclosed county'⁶.

The impulse to enclose was felt widely in the second half of the eighteenth century under the stimulus of a rising population and growing demand for food, but whereas in many counties the wastes remained common grazing ground until the intensification of pressures in the French Wars⁷, in north Somerset these were with some exceptions the only areas still to be enclosed. Attention therefore turned to them, first the Mendips from the 1770s and then the Levels, with interest here increasing from the 1790s. It seems likely that the enclosure of the uplands began first in response to wheat prices which fluctuated upward from the 1750s, because these lighter soils could be more easily adapted to tillage than the richer but heavier soils of the wet grasslands. But the conversion to arable was also eased by the declining use of Mendip for lead and calamine mining, and for sheep rearing for the local woollen industry. It had also long ceased to be a Royal Forest, and with these changes the only remaining barrier was the institutional one of common rights. The cost of extinguishing these in an area shown by the Proportion Roll of 1742 to be the poorest of the ~~region~~ must have seemed daunting, and the fact that Parliamentary enclosure came first in the Mendips suggests

that in making such decisions existing prosperity was less important than future prospects. Drainage problems in the richest area, the Levels, meant that for most farmers grazing continued to be more profitable than tillage. Here the incentive to enclose came later with the significant rise in meat prices during the war years, which led to changes in the organization of land-holding if not in land use⁸.

The legal and institutional changes associated with Parliamentary enclosure, and the new physical features contingent upon it such as roads, drainage channels, fences, and hedges, called for a considerable input of capital, but evidence on the financing of this investment did not at first seem promising. Commissioners' accounts are rare, thus ruling out a study of costs like those conducted elsewhere⁹. However a close study of the surviving awards revealed an alternative source of financial information concealed amongst the profusion of organizational details, which frequently record both the acreage sold to finance the enclosure and the capital sum thus raised. Land sales would normally be viewed as transfers not involving the creation of new assets but a special case is made when the expenditure of the capital raised enables agricultural potential to be realized. Commissioners were instructed by Act of Parliament to sell as much of the land to be enclosed as they judged would enable them to cover all costs, and the details in the awards indicate that they did so. Corroboration comes from the only set of accounts accompanying an award, for

the sum realized by the sale of land recorded in the latter tallies exactly with the total cost of the enclosure accounted for in the former. This method makes the practice in north Somerset different from that of most other areas studied. To sum up: of the 41 Parliamentary enclosures in north Somerset between 1770 and 1830 for which awards survive, 37 were financed by the sale of land and only four by the levying of a rate¹⁰.

These different approaches would have been of limited interest were it not for their different effect on costs. It has been assumed that waste land enclosure costs were high because of the physical problems associated with difficult terrain, but a study of the practice of raising capital sums by land sales indicates that procedural or administrative factors may have been as important as topographical ones. This suggestion directs attention to the people involved with enclosures, all part of the regional network within which the process of capital investment took place. It included advocates of the change, many of whom became commissioners; lawyers and surveyors using their professional skills; landowners and tenants with an expectation of an allotment; and land purchasers at auctions, living within or outside the region (especially in Bristol), and seeking to consolidate an existing estate or to initiate a new one.

The commissioners for each enclosure were named by Act of Parliament. They were usually three in number until the turn of the century, drawn from the 'improvement' minded gentry. John Billingsley was the most active, serving on 11 commissions from the 1780s, including three at his death in 1811. This gave him an unrivalled expertise, but even those sitting on fewer might be active for several decades because of the long gestation of some enclosures. In the early nineteenth century this pattern changed as professional men were appointed to this role and the numbers were reduced to two or even one acting alone. One example is the surveyor James Staples of Bristol, who was the surveyor in four enclosures from 1798, commissioner in three from 1807 and held both offices at Weston-super-Mare in the 1810s. Samuel Baker is an example of an attorney who was very active in this field, working on eight enclosures from 1798, as clerk, witness, umpire, and on three occasions, commissioner¹¹.

After the commissioners had assessed the situation and quality of the land to be enclosed, advised by the surveyors, a public auction was arranged. Due notice was given in the parish church and local newspapers, and it was held at some convenient inn. In the meantime a mortgage was arranged to allow work to begin. At the Wookey enclosure of 1782-86 for example, a mortgage of the moors and commons to be enclosed was executed to the Rev. Henry Harris, rector of the nearby parish of Binegar and a justice of the peace from 1757. £800 was '..paid into the hands of Mr. Robert Wright [commissioner] who is hereby

appointed Treasurer'. Commissioners continued to hold this financial responsibility until the 1810s when for example the Bristol bank of Messrs. Elton, Edwards & Co. were appointed treasurers to the Weston-super-Mare enclosure of 1810-15¹².

Decisions about the amount to be auctioned were complicated by two problems. First, the commissioners had to estimate the internal costs about which there was bound to be uncertainty because of the need for works such as drainage channels. However, unexpected and escalating costs could be met by further sales as in the Bleadon enclosure of 1788-91. Here two auctions were held in 1788, but when in June 1789 it was found 'necessary to raise more money for finishing the several works made and to be made in the Inclosure...', a third was ordered¹³. As an insurance against such delays experienced commissioners may have over-estimated the initial acreage to be sold, especially as they were not legally required to divide any surplus amongst the proprietors, but to invest it in lasting improvements. Second, the commissioners had to assess the external factors affecting the value of land, and again they might misjudge the situation, the unexpectedly high prices realized at some auctions providing them with more funds than anticipated. At Weston-super-Mare the proprietors asked that the surplus be spent on improvements to walls, banks, and roads¹⁴. The possible significance of land sales will now be seen, for with the twin uncertainties of internal costs and external values they could lead to larger sums of capital being

raised with greater ease, and therefore to more costly enclosures, than the method of financing by the imposition of a rate, sometimes grudgingly paid under threat of distraint, which could therefore result in cheaper enclosures.

Only in the case of the Yatton award of 1751 which confirmed a previous and uncomplicated agreement reached by ten proprietors, were the commissioners relieved of the task of dealing with a large number of people and an even greater variety of interests. These included the lord of the manor whose right of soil was usually met by an award one-twentieth in value of the land after sales; the few large proprietors who farmed or leased out land; the more numerous small freeholders, often owner-occupiers constituting what Billingsley called 'a most respectable yeomanry'; and a large number of small tenants and holders of common rights. There were on average about 60 allottees per enclosure, but the number of allotments could be several times that figure because of the tangle of interests represented by claims based on tenancy agreements. These involved copyhold, or leasehold for years or lives, and were not limited by status for the most eminent peer in the county, Lord Poulett, held a manor in Yatton on a lease for lives. The Acts directed that leases at rack rent were to be declared void, but commissioners were to determine adequate compensation for tenants thus deprived. Other tenancy agreements were carried through the land reorganization but allotments were determined by the rights associated with the tenancy rather

than its accrued value. Those in respect of old auster or ancient tenements were to be awarded 'amongst the Leaseholders and Copyholders share and share alike'. Where there was a right to stock different beasts on the commons, a sliding scale would relate the acreage awarded to the number and nature of beasts previously inter-communed¹⁵. Commissioners were also obliged to oversee the exchange of holdings. This was a feature of 31 enclosures, and in two cases the number seeking to improve their position was over 200. Until 1811 these further surveys and exchanges were a charge on the enclosure, but after that costs had to be met by the interested parties¹⁶.

Evidence on the financing of enclosures in north Somerset is shown in Table 6(1), where the information displayed has been derived from the awards. Column 1V show the sums raised by sale or rate, and these are taken to constitute the total public cost of the enclosures listed. Historic prices are given throughout. Financial costs per acre are shown in column V. The three enclosures of the 1770s for which figures are available support the suggestion that the levying of a rate tended to keep down costs (Doulting and Stoke St.Michael, 23.0s per acre), but that land sales led to higher costs (Compton Bishop, 61.5s per acre, and Brislington, 58.5s per acre), for each case faced the physical problems associated with the waste lands, although these varied for individual enclosures, as did other factors such as acreage. In the only other rate-financed enclosure for which evidence is available (Portishead and Weston-in-Gordano,

TABLE 6(1)
Parliamentary Enclosure in North Somerset, 1770-1830

		I	II Common Land				III	IV	V	VI	VII	
SRO Q/RDe	Parish	Act Award	Acreage enclosed	Lowland Waste	Upland Waste	Open Fields	Land Sold Acres	Cost of Enclosure £	Financial Cost per Acre shillings	Selling Price of Land Per Acre shillings	Economic Cost. Per- centage Sold	
—	Cranmore	1770	(400) ¹		Mendip							
62	Ubley	1771-73	902		Mendip		164				18.2	
58	Douling and Stoke St Michael	1775-76	1,200		Mendip		Rate Levied	1,382	23.0			
117	Compton Bishop	1777-79	275	Moors			28	845	61.5	603.6	10.2	
130	Brislington	1778-80	400		Brislington Common		20	1,170	58.5	1,170.0	5.0	
27	Shepton Mallet	1782-85	724		Mendip		Rate Levied					
134	Wookey	1782-86	1,193	Moors	Mendip		411	4,338	72.7	211.1	34.5	
132	Blagdon	1784-87	967		Mendip		283	2,061	42.6	145.7	29.3	
18	West Harpree	1787-90	857		Mendip		438	2,703	63.1	123.4	51.1	
22	Bleadon	1788-91	1,194	Moors	Mendip		243	5,955	99.7	490.1	20.4	
71	Compton Martin	1788-91	[664]		Mendip		372	[2,232]	67.2	120.0	56.0	
21	Westbury	1788-91	841	Moors	Mendip		166	3,091	73.5	372.4	19.7	
55	Rode and Wingfield	1790-92	489		Rode Common		53				10.8	
74	Rodney Stoke	1791-93	754	Moors			56 Rate Levied	2,788	73.9	995.7	7.4	
72	Croscombe and Dinder	1792-93	603		Mendip							
73	Wells (East Hornington and Chilcot)	1792-94	701		Mendip		126	[1,449]	41.3	230.0	18.0	
47	Kewstoke	1793-94	160	Moors			16	903	112.9	1,128.8	10.0	
81	Wells (Out Parish of St Cuthbert)	1793-95	4,343	Moors	Mendip		773	11,319	52.1	292.9	17.8	
65	East Harpree	1794-96	1,033		Mendip		255	2,580	49.9	202.3	24.7	
41	Pilton and North Wotton	1794-96	961	882 acres	Mendip		62	3,199 ¹	72.5	1,031.9	7.0	
42	Banwell	1795-97	1,001	Moors	Mendip		138	4,060	81.1	588.4	13.8	
38	Cheddar	1795-1801	(4,400)	Moors ← 4,000 acres →	Mendip	400 acres Open Fields	587	8,119	36.9	276.6	13.3	
23	Chewton Mendip	1797-1800	2,266		Mendip		345	5,567	49.1	322.7	15.2	
13	Shipham and Winscombe	1797-99	1,072		Mendip		550	3,129	58.4	113.8	51.3	
76	Portbury	1798-1806	962	Moors	Mendip Outlier		244	5,393	112.1	442.0	25.4	
78	Clevedon	1799-1801	488	Moors	Mendip Outlier		52	1,762	72.2	677.7	10.7	
70	Locking	1800-01	(161)	Moors			31	1,605	199.4	1,035.5	19.2	
46	Tickenham	1801-03	561	Moors	Mendip Outlier		57	1,658	59.1	581.7	10.2	
53	Worle	1801-03	211	Moors	Mendip		120	1,232	116.8	205.3	56.9	
6	Backwell	1807-12	(885)		Mendip Outlier		277				31.3	
60	Portishead and Weston- in-Gordano	1807-09	(800)	Moors	Mendip Outlier		Two Rates Levied	3,430	85.8			
133	Congresbury, Week St Lawrence and Puxton	1809 and 1814-16	(820)	Moors	Mendip Outlier	Open Fields	92	3,257	79.4	708.0	11.2	
123	Weston- super-Mare	1810-15	993	437 acres Moors	417 acres Mendip	139 acres Open Fields	72	4,972	100.1	1,381.1	7.2	
124	Wrighton and	1810-13	(3,650)	Moors	Mendip Outlier		210 + 345	555			15.2	
135	Yatton and Kenn	1810-15										
33	Cheddar, Priddy and Rodney	1811 and 1816-21	(1,100)		Mendip		644	7,570	137.6	235.1	58.5	
119	Long Ashton	1813-20	(690)		Mendip Mendip Outlier	Open Fields	65				9.4	
24	Uphill	1813-18	388	Moors ← 348 acres →	Mendip	40 acres Open Fields	57				14.7	
129	Wraxall, Nailsea and Flax Bourton	1813-19	(1,617)	Moors	Mendip Outlier	Open Fields	96	(21 acres sold for £1,279 = 1,218.1 per acre)				5.9
4	Berkley and Standerwick	1814-18	(300)		Commons	Open Fields	49	1,794	119.6	732.2	16.3	
88	Portishead	1814-23	703		403 acres Mendip Outlier	300 acres Open Fields	41	2,150 ¹	106.7	1,048.8	10.2	
113	Dundry	1815-19	(236)		Cotswold Outlier		46	[1,821]	154.3	791.7	19.5	

Source: Enclosure awards as indicated.

Notes: 1 Parentheses indicate an estimated figure, usually derived from the Act of Parliament. Square brackets indicate a figure arrived at by calculation, usually from information within the award.

2 Costs do not refer to the upland acres, as the Mendip proprietors asked that they should pay their own charges.

3 Costs do not refer to the open fields, whose proprietors bore a separate charge. This discretionary power was authorized in four of the later acts covering both waste lands and open fields, but it appears to have been exercised only in this case.

1807-09), complications caused by the intermixing of two parishes may have raised costs, and over-ruled the contrast with contemporary cases financed by land sale.

Although land sales meant that proprietors had to meet no direct financial obligations, they did have to face a very real cost in terms of the reduction in the amount of land allotted, and the loss of the future stream of income otherwise received¹⁷. This economic cost may be measured by the percentage of land sold, as shown in column VII. These economic and financial costs rarely bore with equal severity on the same parish. For example at Locking (1800-01) the financial cost averaged nearly £10 per acre but the economic cost in terms of land and income foregone was less than 20 per cent, whilst at Shipham and Winscombe (1797-99) the financial cost was less than £3 per acre but each proprietor lost over half the land to which he was otherwise entitled. An intriguing aspect of this relationship was the selling price of land, shown in column VI. A high price did not necessarily lead to a reduction in the financial cost of enclosure, but it was generally associated with a reduction in the economic cost. This inverse relationship between the auction price of land and the percentage sold is shown in Table 6(2), where the enclosures for which this information is available are ranked according to the former.

This evidence also suggests there was not one but several land markets, each with its prevailing values subject to such

TABLE 6 (2)
North Somerset Enclosures Ranked According to Average Selling Price of Land
Per Acre

Act	Parish	Average Selling Price Per Acre Shillings	Percentage of Land Sold	Cost of Enclosure Per Acre Shillings	Factors Influencing Price of Land
1810	Weston-super-Mare	1,381.1	7.2	100.1	Extra- agricultural value
1813	Wraxall, Nailsea, etc	1,218.1	5.9	No Evidence	
1778	Brislington	1,170.0	5.0	58.5	
1793	Kewstoke	1,128.8	10.0	112.9	
1814	Portishead	1,048.8	10.2	106.7	Grazing land
1800	Locking	1,035.5	19.2	199.4	
1794	Pilton and North Wotton	1,031.9	7.0	72.5	
1791	Rodney Stoke	995.7	7.4	73.9	
1815	Dundry	791.7	19.5	154.3	Proximity to markets
1814	Berkley and Standerwick	732.2	16.3	119.6	
1809	Congresbury	708.0	11.2	79.4	
1799	Clevedon	677.7	10.7	72.2	
1777	Compton Bishop	603.6	10.2	61.5	Grazing land but with value lowered by lesser quality moorland (salt wharves) or inclusion of uplands
1795	Banwell	588.4	13.8	81.1	
1801	Tickenham	581.7	10.2	59.1	
1788	Bleadon	490.1	20.4	99.7	
1798	Portbury	442.0	25.4	112.1	
1788	Westbury	372.4	19.7	73.5	
1797	Chewton Mendip	322.7	15.2	49.1	(moors) (moors) Mendip Commons with values raised in two cases by inclusion of moorlands
1793	Wells	292.9	17.8	52.1	
1795	Cheddar	276.6	13.3	36.9	
1811	Cheddar	235.1	58.5	137.6	
1792	Wells	230.0	18.0	41.3	
1782	Wookey	211.1	34.5	72.7	
1801	Worle	205.3	56.9	116.8	
1794	East Harptree	202.3	24.7	49.9	
1784	Blagdon	145.7	29.3	42.6	
1787	West Harptree	123.4	51.1	63.1	
1788	Compton Martin	120.0	56.0	67.2	
1797	Shipham and Winscombe	113.8	51.3	58.4	

Source: See Table 6 (1).

factors as the possibility of extra-agricultural development, or the relative demand for arable or animal products. It is these diverse opportunities which may have led to the puzzling variations in financial costs per acre in this region, for there was here no simple chronological escalation as accounted for elsewhere in terms of war-time inflation and the leaving till last of the more complicated and costly cases. Table 6(3) allows these separate land markets to be seen more clearly, as it draws on the small number of awards sufficiently detailed to allow selling prices to be attributed to different types of land in each. It reveals several distinct and separate patterns, so that for example the price of Mendip land per acre moved generally though erratically upwards as the price of wheat also rose with fluctuations from the 1750s, whilst the low moorlands reached a high and sustained price level in the early 1790s when, after little change from the 1770s, meat prices began their dramatic rise¹⁸.

The pursuit of this line of enquiry gives the purchasers of land a special importance, for their judgement was crucial to the determination of prices within the different markets. Most lived in the region and had a close knowledge of the enclosures in which purchases were made, for over half received allotments in lieu of claims, in addition to the land bought. Amongst the exceptions, family links may sometimes be detected as in the case of William Papwell Brigstock esq. of the Albany, London, who purchased nearly 18 acres at the Wraxall enclosure

TABLE 6(3)
Variations in Land Value Within North Somerset Enclosures

		Selling Price in Shillings Per Acre				
<i>Act</i>	<i>Parish</i>	<i>Moors</i>	<i>Mendips</i>	<i>Other Lowlands</i>	<i>Other Uplands</i>	<i>Non-agricultural Use</i>
1777	Compton Bishop	603.6				
1778	Brislington					1,170.0
1782	Wookey	671.6	89.2			
1784	Blagdon		145.7			
1787	West Harptree		123.4			
1788	Bleadon	807.8	266.0			
1788	Compton Martin		120.0			
1788	Westbury	904.9	197.8			
1791	Rodney Stoke	995.7				
1792	Wells		230.0			
1793	Kewstoke	1,128.8				
1793	Wells	1,240.0	225.3			
1794	East Harptree		202.3			
1794	Pilton and N Wotton	1,031.9				
1795	Banwell	1,075.0	366.7			
1795	Cheddar	1,129.8	129.2			
1797	Chewton Mendip		322.7			
1797	Shipham and Winscombe		113.8			
1798	Portbury			667.7	244.8	
1799	Clevedon			677.7		
1800	Locking	1,035.5				
1801	Tickenham			581.7		
1801	Worle		205.3			
1809	Congresbury	2,800.0			347.2	
1810	Weston-super-Mare	1,329.5				1,667.2
1811	Cheddar		235.1			
1813	Wraxall, Nailsea, etc					1,218.1
1814	Berkley and Standerwick				732.2	
1814	Portishead				765.9	3,624.6
1815	Dundry				791.7	

Source: From additional evidence in the enclosure awards this Table develops the findings of Table 6(1) column VI.

(1813-19), in which a William Brigstock received an allotment in settlement of his claim. But most outsiders came from Bristol and many already had a close connection with north Somerset. Richard Bright esq. for example, an original partner in the Bristol bank of Ames, Cave & Co. lived at Ham Green and was entitled to an allotment in the Portbury enclosure (1798-1806) in which he also purchased land at a cost of over £1,000. Samuel Bryant, a Bristol butcher, bought land in the Clevedon enclosure (1799-1801), presumably to fatten stock for the city's markets as his trustee was a grazier. Bristol's long-standing interest in charity lands at Congresbury and Portishead led to the purchase of land in those enclosures by the Corporation. And Bristol glassmaker John Robert Lucas and his partners bought land in the Nailsea enclosure to expand their works there. Perhaps the most purely speculative purchases by Bristolians were of land for house building at Weston-super-Mare, which was poised for development as a seaside resort.¹⁹

Classification presents many problems (see Figure 1, p.291), but from the detailed analysis of each enclosure award it is possible to conclude that yeoman farmers were the main purchasers at 45 per cent of the whole. The gentry (including for convenience the only two noble buyers: the Marquis of Bath, 101 acres at Cheddar; and Earl Waldegrave, 80 acres at Chewton Mendip) made up 35 per cent. Country dwellers not personally involved in farming formed 20 per cent of the total and included clergymen, medical men, and attorneys, as well as

rural tradesmen especially inn-keepers²⁰. The amount bought varied greatly, and according to financial resources and farming needs rather than social standing. An acre or less might round off an existing holding, 20 acres extend it significantly, and 50 to 100 acres establish a new farm. At the enclosure of Shipham and Winscombe (1797-99) for example one yeoman bought 3 and another over 100 acres. At Rode and Wingfield (1790-92) the lord of the manor made the largest single purchase of 50 acres, but a gentleman of similar status bought 2 roods and 14 perches on the bounds of land allotted to him. To sum up: 65 per cent of the land sold (to 18 per cent of buyers) was in units of 50 acres or more; 25 per cent of that sold (to 24 per cent of buyers) was in units of 20 to 49 acres; and 10 per cent of that sold (to 57 per cent of buyers) was of 20 acres or less.

In at least a dozen cases the purchasers had a close connection with enclosures as commissioners, surveyors, and builders. Until the turn of the century (41 Geo.III c.101) there was no bar to the purchase of land by commissioners in enclosures with which they were actively concerned, and rising men such as John Billingsley, Richard Perkins and Gabriel Stone took full advantage of this situation. The highly experienced surveyors John Verry of Bristol and William White of Wedmore (later a commissioner), both bought land in the course of enclosures, as did the building contractors Thomas Curtis of Blagdon and Richard Parsley of Weston-super-Mare²¹. Some of

these transactions may have been made on behalf of others. The rural base of these and other purchasers, and their experience of the business of enclosure, imply a considerable degree of familiarity with the practice of farming in the region. It is likely their bids were made with an awareness of the possibilities of the land on offer, and a realization that it was marginal in the sense of being the next unit available for cultivation (should the cost of bringing it into production be balanced by the revenue it could then produce), rather than in the sense of being poor agricultural land.

The capital sums raised by land sales from the sources now described were laid out on: legal charges, largely incurred in obtaining an Act of Parliament; administrative and executive costs, largely solicitor's and commissioners' fees; interest payments, on the loans raised by a mortgage of lands to be enclosed; and construction costs. This last item is of most interest for this study, since it concerns the physical restructuring of the land to be enclosed, and the new assets created thereby. Information on this matter is limited by the rarity of commissioners' accounts, but what is available has been analysed, and that relating to capital improvements can be seen in Table 6(4). It must be admitted that this evidence is too general (Billingsley's examples) and too limited (three enclosures), but it relates to the critical years 1795 to 1815, and it has an internal consistency. In the three named cases the construction costs formed about 50 per cent of public

Table 6(4)

Analysis of Capital Improvement Costs in North Somerset

Enclosures

	<i>Surveyor's Fees £</i>	<i>Roads £</i>	<i>Fences and Walls £</i>	<i>Drainage Ditches £</i>	<i>Gates and Bridges £</i>	<i>Total Cost of Con- struction £</i>	<i>Improvement Costs Per Acre Shilling</i>
1 Mendip Enclosures mid-1790's	80	350	850		56	1,336	33.4
2 Lowland Enclosures mid-1790's	140	450		850	140	1,580	39.5
3 Shipham and Winscombe Enclosure 1797-99	106	46	1,262		Included in Roads	1,414	26.4
4 Weston-super-Mare Enclosure 1810-15	399	2,448	including sea wall			2,847	57.5
5 Congresbury, Week St Lawrence and Puxton Enclosure 1809-16	916	including road making costs of £102			398 Bridges	1,314	32.0

Sources: 1 and 2 Billingsley, op cit, pp 55-62.
3 SRO Q/RDe 13.
4 SRO Q/RDe 123; WSM Pub Ref Lib LOO/53, S/W17/43.
5 SRO Q/RDe 133; BAO 32395(21), 25642.

expenditure, and in Billingsley's examples they are more nearly 65 per cent, but perhaps his experience enabled him to prevent the loss of some improvement costs to other categories. Surveying was integral to the construction work, so the fees are included here.

The neat classification in this table belies the great range of provisions in the awards. The setting out of public roads was a first charge, but in seven enclosures between 1791 and 1809, largely in the low moorlands, this was found not to be necessary. The provision of fencing also varied greatly. Its

importance was lessened in the lowlands because the essential drainage ditches, deemed a public cost, functioned as boundaries. Before the turn of the century, particularly within the Mendip enclosures, it was not uncommon for the fencing of individual allotments to be a public cost, though not the subdivisions within farms. Afterwards this was less likely, but the outer boundaries (subject to negotiation with adjoining parishes), the public roads, and the land to be sold, were all still likely to be fenced. The allotments relating to special rights, for example those made frequently in lieu of the right of soil, or occasionally in respect of common rights attached to glebe, or rarely in lieu of tithes, were all awarded after the sale of land and therefore bore the economic cost of enclosure. Portishead (1814-23) was the only exception, and here the lord of the manor, James Gordon of the Bristol merchant family, secured his one-twentieth before any land was sold. Although important capital investments, these varied works were undertaken in the course of enclosures in which the main purpose was land reorganization and not reclamation. The large drainage plans in the Levels, and the process of farm making there and in the uplands must now be considered.

ii Drainage and Other Post-enclosure Costs.

The powers of the Commissions of Sewers to deal with floodwaters in the Levels were long-established²². They were authorized to survey walls, drains, sewers, and floodgates, and

to order their reform and repair. Complementary to this oversight was the responsibility of individuals for ditch and wall work, an obligation arising from the ownership or tenancy of land, the failure to fulfil which was punishable by a fine. Local responsibilities were further emphasised by the devolution of the Commission's powers to separate courts, those in north Somerset meeting at Wells, Axbridge, and Wrington. Commissioners resident in the area took advice from juries made up of the owners or occupiers of lands at risk, who watched over banks, walls, rhynes (ditches), and clyces (sluice gates), recommending repairs and improvements where judged necessary. Costs were met by a rate, authorized by commissioners, and collected, spent, and accounted for by juries²³.

The cost of this sharing of initiative and responsibility was a loss of executive momentum at the Courts of Sewers, accompanied by doubts as to their power to initiate major new works. This led to a legal impasse which only began to weaken when enclosure Acts incorporating provisions for drainage were introduced for the region. Although as shown, construction work within enclosures was usually financed as a public cost from the sale of land, the inclusion in some awards of assessments and rates for the making and maintenance of drains and bridges in the way that private roads were funded, demonstrated that new works could be financed by a rate on those benefitting²⁴. Influenced by this, and by the growing awareness of property rights amongst individuals whose access to moorlands had

hitherto been shared with others, pressures mounted for the Courts of Sewers to undertake new rate-financed comprehensive schemes for whole areas.

At the end of the eighteenth century plans were advanced by proprietors for the improvement of the drainage of the River Axe, to which the Commissioners of the Axbridge Division responded by seeking legal advice. They consulted Wyndham Goodden in 1800, and were assured they had 'full powers to carry [the scheme] into execution', and that 'incidental to that Power... they can levy Rates on all those whose lands will be benefitted by it'²⁵. But they persisted with their queries, asking 'by whom the expences hitherto incurred are to be paid and if appeals shod be made agst the Rates and the same [i.e. the Rates] set aside Wher the Commissioners were at any risque and subject to costs thereon'? Counsel's opinion has not survived, but it failed to reassure the Commissioners and they decided not to put their powers to the test. The proprietors were advised instead to seek a Parliamentary Act²⁶. They did so and the Axe Drainage was undertaken 1802-10.

Evidence on the negotiations preceding the Weston Drainage of 1810-15 is lacking, but when the Commissioners of Sewers for the Northern Levels faced pressures to improve the Congresbury Yeo, they had similar fears about their powers. In 1812 advice was sought on whether in relation to clearing out rhynes, a distinction could be made between repairs, which were the

subject of old obligations, and improvements, which may be charged to the whole Level. The opinion given was that they might make an order for improvement as well as maintenance on the owners immediately concerned and see if it were challenged. But such uncertainty was anathema to the Commissioners who feared that 'in the Event of any Proceedings agt them in the Execution of their Office, the Expence of defending will fall upon them which will be very hard...'27. These worries spread to the professionals in their employ. After spending more than a year surveying the Congresbury area and drawing up a rating assessment, the Bristol surveyor Young Sturge wrote to the Commissioners' solicitor in Feb. 1812 of the hardship of being accountable to those he employed whilst himself having no one to whom he could look. The opinion of Counsel was that a rate could be made to meet the expenses of those 'employed for carrying their orders into execution'28, but the Commissioners' fears about personal liability were so great that eventually an Act of Parliament for the Congresbury Drainage of 1819-26 was obtained.

This fear of jeopardizing personal finances by initiating new works towards which those benefitting had no obligations by traditions of tenure, shows that in handling investment funds the Commissioners of Sewers were less well-protected than the Enclosure Commissioners or Turnpike Trustees, who were also engaged in the business of capital formation by the raising and investment of public funds but without the worry of personal

assets being placed at risk. The difference lay in the legal provisions under which they operated, and it was this understandable caution on the part of the Commissioners which obliged proprietors to obtain Parliamentary authorization for the improvements they sought. The pattern adopted echoed that already established for land enclosures, in that commissioners were appointed with the power to finance and execute certain specific capital works. As with drainage work undertaken in the course of enclosure, the administration of the completed works passed to the Courts of Sewers.

The individuals appointed to execute these large-scale plans for investment in Parliamentary drainage were often those who were also engaged in Parliamentary enclosures. This applied to: the commissioners, whether of the gentry like Francis Edwards Whalley esq. of Winscombe, or the professions like Young Sturge, Land Steward to Bristol Corporation (1810-44) and already mentioned; the main surveyors such as William White of Sand near Wedmore; and the attorneys for example Samuel Baker of Blagdon²⁹. In contrast professional engineers of national standing like William Jessop and John Rennie rarely worked on enclosures, but they had great responsibilities in the drainage schemes, devising or approving the new works which were then constructed by local men of wide experience in the region.

Tables 6(5), 6(6), and 6(7), provide an analysis of the drainage schemes, and give a further insight into the process

of capital investment. Costs shown in the first three columns varied according to particular circumstances such as the number of commissioners and the timing of their activities. As the award came to be drafted by the clerk and deposited with the justices for example, the administrative expenses shown in column II rose. The interest figures of column IV were a feature of the first part of each scheme, for as assessments were drawn up and rates collected, the money borrowed on a mortgage of the rates was repaid. In the Axe Drainage three sums of £5,000 each were borrowed from Messrs. Messiter, Payne, & Messiter of Wells, bankers to the scheme. In the Weston Drainage £3,000 was similarly raised, but as one sum in 1810 from Philip John Miles esq. in his personal capacity, and not as a partner in Messrs. Miles, Vaughan & Co., bankers of Bristol and treasurers to the undertaking. This wealthy Bristolian had an interest in the scheme through lands in northwest Somerset, and he had earlier provided £564 (repaid in 1810) to initiate proceedings. For the Congresbury Drainage the attorneys concerned provided this facility and the treasurers, Bristol bankers Messrs. Ames, Bright & Co. allowed an over-draft which had reached £2,250 by 1821³⁰.

Although the schemes as a whole were concerned with the creation of capital assets, the costs listed in columns V to VII concern the physical aspects most closely. Column V covers the costs of surveyors and engineers, including the fees for assessments on which rates were based³¹. The costs listed in

column VI were for construction work done under contract³². Those in column VII may appear less acceptable as investment costs, but if major new works were to be constructed then interests in land and buildings had to be bought out, and damages paid. These were more than transfer payments because they enabled land to become part of a drainage system capable of increasing the productive capacity of a territory larger than that immediately concerned. The annual expenditure in column VIII is doubly important. It shows that the levying of rates secured financial support for schemes long before their completion was seen in an increased productivity of land, and it also describes the case of fixed assets built over a period of time, which may be regarded conventionally as fixed capital formation, and not simply as work in progress. The calculation of annual costs as a proportion of total expenditure is shown in column IX.

Despite the common background of region and procedures the pattern varied considerably in the three schemes. In the case of the Axe, fed by south-flowing streams from the Mendips and reaching the coast at Uphill, the problems had been much examined and debated before the scheme was embarked upon, and this is shown by the fairly even distribution of costs in the first years, seen in Table 6(5). Fees paid to the famous engineer William Jessop appear from 1803, and it was his scheme for a tidal clyse to keep out sea water at Hobb's Boat, and major cuts in the meandering River Axe at Loxton, Rackley, and

and Bleadon, which was carried out by William White in the steady manner shown by the distribution of costs in Column VI, and reflected in column IX. 10,218 acres were rated.

The pattern of costs in the scheme to drain the isolated Weston-in-Gordano valley opening into the Avon estuary was determined by the problem of the tide mill at Portishead owned by Bristol Corporation. The tenant had the right to admit sea water to the main drainage channel, and to use that as a mill pond from which water was released to provide power rather than drainage. Table 6(6) shows that major expenses came in the first year when the tenant received £1,500 for his leasehold interest, and in the last year when Bristol Corporation was paid £1,114 for its freehold interest, reduced from £2,214 on the re-purchase of the buildings. In the intervening years the drains, a legacy of the Parliamentary enclosures, were improved and co-ordinated on a plan devised by Josias Jessop and implemented by William White³³. 1,537 acres were rated.

In the Congresbury Drainage the aim was to drain the moorland valley of the Yeo which flowed to the coast north of Mendip. As Table 6(7) shows, 67 per cent of the total accounted for was spent in the first two years of the scheme, in response to the enterprising plan put forward by the engineer John Rennie. The problems were common to the Levels, with inflows of sea water hampering the drainage of water from the moors and increasing the likelihood of flooding, but the solution was innovative.

Table 6(5): The Axe Drainage Scheme, 1802-1810

	I			II			III			IV			V			VI			VII			VIII			IX	
Year	Legal- Parliamentary			Admin- istrative			Executive 3 Com- missioners			Interest			Surveying- Engineering			Construction- Improvement			Land Purchase & Damages			Annual Expenditure			VIII as prop- ortion of total Expenditure	
	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	%	
1802	1,179	15	4	244	11	7	132	6	0	125	0	0	501	19	0							2,183	11	11	5.4	
1803				158	12	8	198	9	0	250	0	0	399	10	0	900	0	0				1,906	11	8	4.6	
1804				248	6	3	245	14	0	375	0	0	599	7	4	1,126	13	0	92	17	0	2,687	17	7	6.6	
1805				294	5	7	66	3	0	500	0	0	304	3	0	2,200	0	0	113	2	2	3,477	13	9	8.5	
1806				304	0	0	166	19	0	250	0	0	142	17	0	5,014	0	11½	986	12	4	6,864	9	3½	16.8	
1807				181	19	1	103	14	0	247	0	0	198	14	0	3,583	8	0	843	10	0	5,158	5	1	12.6	
1808				290	13	6	242	1	0				434	0	0	4,971	3	10	466	13	6	6,404	11	10	15.7	
1809				438	9	4	349	13	0				190	6	0	4,736	6	3	1,620	13	2½	7,335	7	9½	17.9	
1810				484	10	11	280	7	0				50	0	0	3,198	4	4	834	4	11	4,847	7	2	11.9	
Total	1,179	15	4	2,645	8	11	1,785	6	0	1,747	0	0	2,820	16	4	25,729	16	4½	4,957	12	1½	40,865	16	1	100.0	
Sum- mary 1802- 1813	1,210	6	4	2,922	0	5	1,786	1	0	1,747	0	0	2,609	8	10	25,736	7	6	5,045	13	5	41,056	17	6		

Plus balance in Treasurer's hands of £50 2s 7d therefore Total Cost = £41,107

- Sources: 1 S.R.O. D/RA, AD4. "Commissioners' Accounts" presented annually to the Wells Epiphany Sessions, 1803-1811. Figures for 1802 are from July of that year to the following January. Succeeding years cover the period between the Epiphany Sessions.
- 2 S.R.O. D/RA, AD5. "Account Book" of the Drainage Commissioners, giving details of individual accounts 1802-1812.
- 3 S.R.O. D/RA, AD4. "Summary of Accounts" 1802-1813. This provides evidence for the total cost, and the distribution of costs (last line of table above), as it includes bills settled after the Award had been drawn up.
- 4 S.R.O. D/RA, AD4 "Mr Conway's Bills of Expences" 1800-1804.
- 5 S.R.O. D/RA, AD3 "General Cash Account" 1812-1819.

Table 6(b): The Weston Drainage Scheme, 1810-1815

Year	I Legal- Parliamentary			II Admin- istrative			III Executive 2 Com- missioners			IV Interest			V Surveying- Engin- eering			VI Construct- ion - im- provement			VII Land Purchase & Damages			VIII Annual Expenditure			IX VIII as prop- ortion of total Expenditure %	
	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d		
1810	1,059	1	11	117	19	10	100	0	0	14	3	4	53	10	9	450	0	0	1,500	0	0	3,294	15	10	40.7	
1811				181	15	8	58	3	0	160	14	3	142	16	0	600	0	0				1,143	8	11	14.1	
1812				429	14	9	116	2	6	95	18	8	46	16	6	144	0	0	256	1	2	1,088	13	7	13.4	
1813				88	4	3	95	1	9	105	2	11	5	5	0	103	8	5	67	16	7	464	18	11	5.8	
1814				75	4	4	147	10	8	7	6	5				127	8	3	52	0	0	409	9	8	5.1	
1815				399	12	11	116	13	7							21	0	0	1,159	0	0	1,696	6	6	20.9	
Total	1,059	1	11	1,292	11	9	633	11	6	383	5	7	248	8	3	1,445	16	8	3,034	17	9	8,097	13	5	100.0	

Plus balance of £611 14s 10d in Treasurer's hands therefore Total Cost = £8,709 8s 3d

- Sources:
- 1 S.R.O. D/RA, SW11. "Commissioners' Proceedings", 1810-1815.
 - 2 S.R.O. D/RA, SW11. "Rate Book, August 1811, Assessor Wm White".
 - 3 B.A.O. O1105(7). "The Commissioners of the Weston Drainage to Hall and Leman" 1809-1812.
 - 4 S.R.O. D/RA, SW11. "The Commissioners of the Weston Drainage to Hall and Leman" 1813-1814.
 - 5 B.A.O. O4205. "Bank Pass Book. Weston Drainage Commissioners" 1810-1843.
 - 6 S.R.O. D/RA, SW11. Items of correspondence including tenders, bills and receipts, 1810-1815.
 - 7 B.A.O. O1101(2). Receipts 1814-1815.
 - 8 B.A.O. O1101(3) and (7). Documents relating to the balance in hands of Treasurer.

Table 6(7): The Congresbury Drainage Scheme, 1819-1827

	I			II			III			IV			V			VI			VII			VIII			IX		
Year	Legal-Parliamentary			Admin-istrative			Executive l Com-missioner			Interest			Surveying-Engineering			Construction Improvement			Land Pur-chase & Damages			Annual Expenditure			VIII as Prop-ortion of Total Expenditure %		
	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d			
1820	983	16	4	311	15	0				47	13	0	624	7	2	3,278	12	0	42	15	0	5,288	18	6	43.9		
1821				110	15	0	95	11	0	68	3	2				2,180	13	7	302	2	7	2,757	5	4	22.9		
1822				189	12	6				27	16	6	196	10	0	472	18	3	67	16	9	954	14	0	7.9		
1823				53	19	6	100	0	0	16	9	10	69	5	0	771	14	5	145	16	0	1,157	4	9	9.6		
1824													29	16	0	47	0	6	87	17	0	164	13	6	1.4		
1825																13	7	6	14	1	3	27	8	9	0.2		
1826				230	0	0							135	14	2	126	14	0	425	0	5	917	8	7	7.7		
1827				417	17	11	114	4	0				155	7	0	84	8	4				771	17	3	6.4		
Total	983	16	4	1,313	19	11	309	15	0	160	2	6	1,210	19	4	6,975	8	7	1,085	9	0	12,039	10	8	100.0		

Plus balance in Treasurer's hands of £386 11s 10d therefore Total Cost = £12,426 2s 6d

Sources: S.R.O. D/RA, SW11, with a second copy B.A.O., O9337. A single volume of "Proceedings Under the Congresbury Drainage Act" contains both the deliberations of the Commissioner, pp 3-59, and a copy of his accounts, pp 60-80. Although the former records the payment of legal expenses with interest in July 1819, these do not appear in the latter until July 1820, for which year they are shown above.

Rennie calculated that the lack of fall could be overcome by increasing the number of channels across the barrier of the coastal clay belt, so he recommended a new cut from the estuary of the Yeo to the inland moors, with major branches either side of the river which was to be crossed by a culvert. A new sluice called Sampson's Clyse was to be constructed at its seaward end. As column VI indicates, the bold scheme was quickly begun and the lower expenditure of the later years shows that problems were minimal³⁴. 2,651 acres were rated.

As the sum levied by rate was a contribution to fixed capital formation it would be reasonable to assume its payment was the responsibility of the landlord, for the traditional division in English farming has been between the landlord's provision of items of fixed capital, notably buildings and drainage, and the tenant's provision of stock and working capital³⁵. But in north Somerset the rate to finance capital investment in drainage schemes was by Act of Parliament shared between landlords and their tenants according to the different forms of tenancy. Landlords were to pay the full costs for rack rent tenants; to share them with rack rent tenants holding a lease for a term of years; and to have a lesser responsibility where other forms prevailed, for example tenants in tail or for life³⁶. The second case may have presented the most difficulty as can be illustrated from the following note inside a Rate Book for the Axe Drainage, 'Supposing the fee simple to be worth twenty eight years purchase, the rate imposed upon the land should be

borne by the Rack Rent Tenant or the Landlord in the following proportions...', which are then related to the unexpired years of the lease³⁷.

Correspondence amongst the Congresbury Drainage papers shows however that ^{some} landlords assumed their tenants would finance the scheme. A note of 1811 says, 'John Walter of Milton refuses to pay saying it belongs to his tenant Samuel Pearce to pay, he occupying the premises to which the common belongs', and in 1812 the Bishop of Bath and Wells wrote that as the lands of his see were already well drained he hoped the tenants would not be subjected 'to any Part of the Expence attending the Improvement of the Congresbury Drainage, from which they can derive little or no benefit'³⁸. But the many surviving assessments and rates (like those concerning property owned by Queen Elizabeth's Hospital, Bristol, where most tenancies were held on lives), show that commissioners apportioned the responsibility as instructed by law³⁹. The conclusion is therefore that some tenants contributed to capital investment.

Lastly, it may be calculated from the available evidence that the cost of the Axe Drainage was on average 80.5s per acre, of which capital improvements (covering surveying, construction, land purchase and damages, crucial to the new work) accounted for 65.4s per acre. In the Weston Drainage the respective costs were 113.3s and 61.5s per acre, and in the Congresbury Drainage they were 93.7s and 69.9s per acre.

Although it cannot be claimed that all the lands involved in these schemes had previously been the subject of Parliamentary enclosure, the overlap is great enough for them to be regarded in many cases as two aspects of the same process of capital investment. It has been noted that in the Weston Drainage some of the channels dug earlier in the course of enclosures were improved. This suggestion can be taken further with the Axe Drainage, for six of the parishes covered by that scheme of 1802-10 included land which had been enclosed between 1777 and 1801. The combined cost of enclosure (averaging 69.7s per acre) and drainage (80.5s per acre) was 150.2s per acre. This is so close to the estimated cost of 150.0s per acre for the Parliamentary enclosure of the waste lands in general in the years 1802-1815 calculated by Holderness⁴⁰, as to suggest that the extensive drainage provisions included in those cases were undertaken in north Somerset not as an enclosure but a post-enclosure investment.

The rare survival of extra-award documents for the Congresbury, Week St. Lawrence, and Puxton enclosure of 1809-16 which preceded the Congresbury Drainage of 1819-26, allows the complementary relationship between lowland enclosure and drainage to be examined in greater detail, especially in terms of capital improvements. The overlap applied to about one-third of the acreage drained; to the personnel, for Young Sturge acted as commissioner for the enclosure and surveyor to both schemes; and to the basic engineering concept for John

Rennie's new cut from the sea back to the moors linked up with the channels dug during the recently completed enclosure. This close constructional relationship was reflected in the funding of the work, which provides specific evidence of the general case being made. Thus in terms of capital improvements the Congresbury enclosure and drainage costs of 32.0s and 69.9s per acre, were at a total of 101.9s per acre very close to the putative costs of 101.1s per acre for the years 1802-15, derived from Holderness' estimates. Viewed in this perspective the north Somerset enclosures initiated the process of capital investment, and made possible the further works of drainage, soil reclamation, and farm making, by which waste lands were converted into productive farms.

Unlike the processes of enclosure and drainage, investment in farm making was a matter for individuals about whom little may be known. The lack of primary evidence means that great weight has had to be placed on contemporary writers, especially John Billingsley. This limitation is unfortunate but can be justified, for this Mendip landowner and farmer was an active member of the Bath and West Society and so in touch with private developments in the region, as well as being involved in public undertakings as a commissioner of enclosures and sewers. And his estimates have proved reliable when checked against alternative sources. For example, as Table 6(8) shows,

his estimation of 48.8 to 50.0s per acre as the cost of Mendip enclosure, is very close to the average for that area of 48.5s per acre before the mid-90s (when the Agriculture of Somerset was written), derived from evidence assembled in Table 6(1). From this source too comes evidence that at Chewton Mendip the cost of enclosure at the end of the 1790s was 49.1s per acre. This is incorporated in Table 6(8) under the heading of Wigmore Farm, which was created by this enclosure and will be examined more fully later.

From Billingsley's generalizations, supported by evidence in the awards, it may be said that upon enclosure the Mendip farmer received land which was likely to have been fenced and provided with public roads, but for which the extra costs of farm-making had to be borne individually. Billingsley held that investment in buildings was of major importance 'for the purpose of creating a distinct farm'. Costs varied according to acreage, but on most Mendip farms of 100 to 200 acres, 'a farmhouse, barn, stable, stalling, barton, pool and pig-stye' would cost about 50.0s per acre. This and following estimations have been incorporated in Table 6(8). A second basic cost was that of fencing individual fields with limestone walls or hedges. Michael Williams has shown that Mendip fields varied, with more than half being less than 10 acres, nearly a third between 10 and 20 acres, and the remaining sixth over that figure. On a 100 acre farm with ten oblong fields (a shape recommended by Billingsley), it may be estimated that walls or

Table 6(8): Farm Creation Costs on Mendip (shillings per acre)

Soil Type or Location	Cost of Parliamentary Enclosure	Post-enclosure Costs				Total Farm Creation Costs
		Farm Buildings	Establishment Costs - Fences, Roads	Reclamation Costs	Total Post- enclosure Costs	
Wigmore Farm. Ston Easton Series	49.1	47.3	31.2	103.4	181.9	231.0
Silty, well- drained soil. Nordrach Series	48.5	50.0	36.0 -	124.5 -	210.5 -	259.0 -
	48.8		56.5	132.0	238.5	288.5
	50.0					
Peaty soil on clay pan. Priddy Series	48.5	50.0	36.0	179.8 -	265.8 -	314.3 -
	48.8			263.3	349.3	399.3
	50.0					

Sources: 1 Tables 6(1), 6(9).

2 Text pp.187,189.

3 Billingsley, "Culture of Potatoes" 1793; Agriculture of Somerset, 1795; "Bath and West of England Society" 1805; "Essay on Waste-Lands" 1807.

NOTES: These figures show a cumulative sequence of investment. Those for Wigmore Farm, Chewton Mendip, cover the years 1797 to 1806. In the two general examples parliamentary costs are for the years to the mid-1790s, post-enclosure costs cover the following decade. Changing price levels constitute a difficulty for such an exercise, but this problem has been to some extent accommodated by the fact that the suggested investment would have taken place in sequence over the years indicated.

hedges would cost 36.0s per acre. Billingsley himself created nearly 100 miles of fencing on between 3,000 and 4,000 acres of his own land in the years before 1805, at an estimated cost of 56.5s per acre⁴¹.

Buildings and fences formed the background for what Billingsley described as 'nothing less than the process by which this comparatively barren soil is converted into fertile and productive land'. On the widespread soils of the Nordrach series, see Table 6(8), reclamation consisted largely of repeated ploughing, harrowing, and liming, at a cost of 124.5s per acre in the mid-1790s. Ten years later the cost was an estimated 132.0s per acre, though this included an allowance for clearing difficult ground. Billingsley followed these procedures himself, reclaiming the 3,000 to 4,000 acres noted above by ploughing four or five times and spreading 500,000 bushels of lime. With the poorly drained and acid soils of the Priddy series however, a hard clay pan just under the surface had to be broken up. Billingsley recommended the planting of potatoes and in the 1780s he reclaimed several plots this way at an average cost of 179.8s per acre, rising to 263.3s per acre by 1803. It was costly he said, for Scotch seed potatoes had to be purchased in Bristol, and wage rates increased to replace workers lured away by builders there and in Bath. The procedures followed at Wigmore Farm in Chewton Mendip, set out in Table 6(9), serve to confirm Billingsley's account, although reclamation costs were lower, perhaps because the free draining

Table 6 (9): Farm Making in the Mendips. Wigmore Farm, Chewton Mendip, 1797-1806.

Form of Expenditure	Cost	Distribution of Costs	Proportion of Total Cost	Cost per Acre
	£ s d	£ s d	%	Shillings
<u>Cost of Buildings</u>				
Cottage	44 14 10			
Farm-house & offices	480 0 0			
Stable	106 0 0			
Barn	160 0 0			
Stalling etc	<u>100 0 0</u>			
	890 14 10			
Not yet erected are				
dairy-house, waggon-house, pig-styes	<u>150 0 0</u>	1,040 14 10	26.0	47.3
<u>Establishment Costs</u>				
Stone & quick fences	287 19 0			
Roads	100 16 4			
Four Limekilns	40 0 0			
Future tending of fences	<u>256 10 8</u>	685 6 0	17.1	31.2
<u>Reclamation Costs</u>				
Cutting furze, levelling, hauling off stones, draining	183 19 2			
Ploughing, dragging and manuring 380 acres with 160 bushels of lime per acre	<u>2,090 0 0</u>	<u>2,273 19 2</u>	<u>56.9</u>	<u>103.4</u>
TOTAL		£4,000 0 0	100.0	181.9

Source: Billingsley, "Essay on Waste-Lands", 1807, pp 45-47.

NOTES: The parish of Chewton Mendip was enclosed in the years 1797-1800, S.R.O. Q/RDe 23. The 440 acre farm then created was improved in the course of the following years, as shown above. In 1806 its rental value was £420 per annum.

and loamy soils of the Ston Easton series on the flanks of Mendip were easier to work⁴².

Despite the interest of contemporary farmers and writers such as Richard Locke of Burnham and Thomas Davis of Longleat, steward to the Marquis of Bath, Billingsley remains the best informant on farm making in the Levels. The costs of enclosure are shown in Table 6(10), where the figures of 60.0 to 62.1s per acre come from Billingsley's estimates⁴³. That of 97.9s per acre for the clay lands, derived from Table 6(1), exceeds his figure, but that of 67.7s per acre from the same source for the rest of the Levels before the mid-90s comes close to it. In the course of lowland enclosure a network of channels were created which drained the land and separated farms, but the additional costs of Parliamentary drainage (where needed) and farm making still had to be met.

The boggy peats and clays of the Levels were a challenge to the improver, but the continuing profitability of the pastoral farming long associated with the lowlands blunted enthusiasm for reclamation and a change to arable. Farms were not large, those for dairying being usually 50 to 120 acres and for grazing somewhat more, but they were profitable. Billingsley wrote of dairy farming, 'There are few trades in which a small capital can be employed to greater advantage than this', and in T.D.Acland's view 'The graziers are generally a substantial body of men', requiring more capital to stock their land than

dairy farmers. Locke summed up the general prosperity of both by claiming to know fifty farmers within a few miles, worth ten thousand pounds each, built up by themselves or their fathers over the last fifty years⁴⁴.

Billingsley was curiously neglectful of buildings as part of the process of farm making in the Levels, and only one independent item of relevance has been found. This refers to the building of a new farm in the Northern Levels between 1808 and 1810 at a cost of £970, but as there is no hint of the acreage concerned, average costs cannot be calculated. Although the rhynes built around farms as an enclosure provision were primarily for drainage, linking up with major channels, their depth of five feet and width of eight at the top also made them a formidable boundary. Field drainage however was the responsibility of individual farmers, and as with the uplands the estimation of this post-enclosure cost depends on the size of fields involved. Those newly enclosed were generally smaller than the 20 to 40 acre fields of the settled clay grazing lands. Williams has judged that they were from 5 to 15 acres, being commonly 10 acres, and he quotes a contemporary observation of 'regular quadrilateral enclosures and moors intersected by rectilinear canals'. On the basis of 10 rectangular fields on a 100 acre farm, and according to Billingsley's estimates for the work, the sub-division and draining of enclosure allotments would generally have cost 6.0s to 7.5s per acre, though more in the worst turf bogs ⁴⁵. See Table 6(10).

Table 6(10): Farm Creation Costs in the Levels (shillings per acre)

Soil Type	Cost of Parliamentary Enclosure	Post-enclosure Costs				Total Farm Creation Costs
		Drainage Internal to Farms	Reclamation Costs	Parliamentary Drainage	Total Post-enclosure Costs	
Estuarine clay Wentloog Series	60.0 62.1 97.9	7.5	Manured by contents of ditches.	80.5	88.0	148.0 - 185.9
Red Alluvium Compton Series	60.0 62.1 67.7	6.0	No extra costs given.	80.5	86.5	146.5 - 154.2
Black Moory earth. Godney Series	60.0 62.1 67.7	6.0	94.0	80.5	180.5	240.5 - 248.2
Turf Bog. Sedgemoor Series	60.0 62.1 67.7	6.0 plus 5.0	56.0 plus 48.0-64.0 or 200.0	80.5	195.5 - 291.5	255.5 - 359.2

Sources: 1 Tables 6(1), 6(5).

2 Text pp. 194-5.

3 Billingsley, Agriculture of Somerset, 1795; "Essay on Waste-Lands" 1807.

NOTES: In this cumulative sequence of investment, parliamentary enclosure costs are for the years up to the mid-1790s, and post-enclosure costs cover the period to 1810.

Soil reclamation costs in the Levels varied according to the different problems faced. Clay lands could be kept in a state of 'unabating fertility' by manuring with the contents of ditches, and only labour costs were involved. Such land could be rented for 40.0s to 60.0s per acre. On the red alluvial soil drainage was of chief importance. If tilled it was 'capable of bearing a variety of crops in the highest perfection'. Its value was 45.0s per acre. Even the 'black moory earth' could be made productive by the incorporation of a thick coat of clay or red earth, and Billingsley referred to the skilful management of his land by Mr. Lax of Godney in illustration of this claim. The land forming this recently enclosed farm had been purchased from the Commissioners for £15 per acre, and additional drainage and claying had cost another £5 per acre. The 35 acres were then able to support a herd of 20 cows and a bull, and the rented value was 20.0s per acre. If the cost of extra drainage was 6.0s per acre as already calculated, then the additional claying must have cost a further 94.0s per acre. This was high, but not as great as the cost of re-claiming the turf bog. The basic work of burning the vegetation, ploughing deeply, digging ditches, and manuring with the black mould which lay above the peat, would cost 56.0s per acre. The addition of clay or red earth would cost a further 48.0s to 64.0s per acre but the land would then be worth 25.0s to 30.0s per acre. Again Billingsley sought to provide an encouraging example, that of Mr. William Moxham of Glastonbury who had advanced the rental of his land from 1.0s to 30.0s per acre. This had been achieved largely by

draining, and earthing with some 100 to 150 cart loads per acre of red earth at a cost of more than 200.0s per acre⁴⁶. These estimates are also shown in Table 6(10).

iii Conclusions

This study of capital investment in agriculture in north Somerset has shown how the process was facilitated by the existence of a matrix of individuals acting in response to influences within the region as well as to their own concerns. This network included the agricultural interest, yeoman farmers as well as large landowners; professional men such as lawyers, bankers, surveyors and engineers; investors and speculators; and enthusiasts for change, who undertook public 'improvements' as gentlemen amateurs, before the professionals asserted themselves. Amongst all of these the Bristol interest was well-represented, by professionals based in the city, or wealthy individuals and institutions who either already owned land in the region, or purchased it through the new opportunities offered. By the use of Parliamentary powers which established the right of commissioners to undertake new work, open lands were enclosed, and large-scale drainage works effected. The levying of a rate in the Levels had the advantage of enabling new works to be financed by instalments, but the practice of raising enclosure capital through land sales had more important consequences. It brought relief from the constraints of rate finance and allowed more capital works to be undertaken than

might otherwise have been the case. But this resort to the land market did more than affect the magnitude of capital available, it also shifted the focus from the endogenously determined question of the demand for capital, to that of its supply. It therefore introduced an element of personal judgement (through commissioners' decisions about the amount of land to be sold, and purchasers' decisions about the price of land to be bought) which emphasizes that enclosures, drainage, and farm making must be viewed in the commercial context of expectations about land use and financial returns, rather than the disinterested setting of a belief in agricultural improvements, whose advocates were in any case not averse to taking advantage of the opportunities they had helped to create.

The task of determining the financial returns to this investment is daunting, especially as it concerns the interpretation of inadequate evidence for a specialist purpose. However an attempt will now be made to draw some conclusions, on the basis of the increase of rents and accruing capital value of the land concerned. By his analysis of developments at Wigmore Farm, Chewton Mendip, around the turn of the century, Billingsley provides some welcome information on the subject. The rent of the unenclosed and unimproved common land was 4.0s per acre, which gives the 440 acres to be enclosed a capital value at 25 years purchase of £2,300, if the contemporary practice of estimating this by a capitalization of rents is observed. By 1806 when the farm establishment analysed in Table

6(9) had been undertaken, the rent had risen to 20.0s per acre and the capital value at 25 years purchase was then £10,500. How far this increase reflected external factors such as the general price inflation we cannot tell, but the possible inclusion of an element of 'pure' rent in the Ricardian sense is unlikely, for Wigmore Farm exhibits that conversion of marginal into productive land which itself increased the returns to longer cultivated acres. The choice of this example was a particularly happy one by Billingsley, for from the Chewton Mendip Award the further calculation can be made that the enclosure was undertaken at a cost of 49.1s per acre, financed by the sale of land at a little more than £16 per acre, Table 6(1). From its earlier price of £5.2s per acre unenclosed, the prospect of enclosure had thus raised the cost of land about three fold, which confirms Billingsley's views of the general effect of this process on land values⁴⁷.

This dove-tailing of evidence from the Award and Billingsley can be used to make a more detailed study of the way the rate of return on capital changed in response to the investment made. If, as the result of the expenditure of 49.1s per acre to cover enclosure costs, the rent of land forming Wigmore Farm rose from the 4.0s per acre given by Billingsley to the 12.8s per acre derived from the selling price of £16 per acre, then this indicates a rate of return on investment in land re-organization alone of 17.9 per cent which is within the range suggested by some writers⁴⁸. But in the Mendips this investment

was not enough, and Billingsley described the fall in rents and in the rate of return to capital invested, when an enclosure was not followed by the close attention to buildings and soil reclamation described at Wigmore Farm. But there was a disincentive, for the returns to this further investment were not as great as those to enclosure itself. Thus at Wigmore Farm the 49.1s per acre which raised rents by 8.8s per acre and produced a rate of return of 17.9 per cent, was followed by a further investment of 181.9s per acre which raised rents a further 7.2s per acre and produced a rate of return of 3.95 per cent. Had this supplementary investment not been seen as a safeguard of the initial capital input, many would doubtless not have made it. As it was it contributed to a rate of return of 6.9 per cent on the investment of £11.55 per acre between 1797 and 1806 in the enclosure and post-enclosure costs, reflected in the increase of rent from 4.0s to 20.0s per acre. This special case is borne out by further contemporary evidence of a more general nature, cited by Billingsley⁴⁹.

In the only example in the Levels where the costs of enclosure and farm creation can be similarly distinguished, Billingsley noted that on a turf bog farm, rents had advanced from 1.0s to 30.0s per acre at a reclamation cost of 291.45s per acre. To this must be added enclosure costs of 67.7s per acre. Despite the higher overall investment figure of £18 per acre, the rate of return at 8.0 per cent was comparable to that in the Mendips because the relative increase in rents was

greater. In the clay and alluvial soils of the Levels the rents rose higher and farm making costs were lower than in the turf bogs. The rate of return may have been from 13.0 to 16.0 per cent, but there is no specific case from which this may be argued⁵⁰. To sum up, it seems fair to say that in the period of the 1790s and early years of the following century, covered by contemporary evidence, the rate of return on investment in enclosure and farm making was an estimated 7.0 to 8.0 per cent, though according to circumstances which cannot be explored here it could have been as low as 4.0 or as high as 16.0 per cent. In Billingsley's judgement the profits at Wigmore Farm were 'sufficient to satisfy any reasonable person', but although 6.9 per cent was a good return on a safe investment, it does not suggest that the enclosure and reclamation of the waste lands was the very profitable use of capital it is thought to have been.

Billingsley recommended the adoption of mixed farming⁵¹, but this advice was largely ignored as farmers followed the market and concentrated on lucrative grain crops in the uplands and pastoral farming in the lowlands. In these circumstances the further investment needed to capitalize on the procedures of enclosure and drainage was not readily forthcoming, because in the short run favourable returns could be secured without it. This is shown for example in William's analysis of the Property Tax of 1815, which led him to conclude that although rents within the county varied widely, the average rent of over

30.0s per acre was amongst the highest in England at that time, being matched or surpassed only by six counties⁵². By the mid-nineteenth century however, Acland was lamenting that the 'Want of capital is the cause which most retards farming in Somersetshire'. He was particularly critical of Bristol landowners in this respect, finding lands administered by charitable trustees neglected, and those 'purchased as investments by residents..left unimproved..if their rent is paid regularly'⁵³. Sometimes the Bristol connection led to land being withdrawn altogether from farming stock, as magnates such as the Smythes of Long Ashton and the Eltons of Clevedon Court enhanced the setting of their houses by extending parklands, planting trees and creating walks on ground allotted, bought, or exchanged during enclosure⁵⁴. For some, the returns to this investment were thus private and immeasurable as well as financial. But in general it was upon the last-named that expectations were focussed, and in this respect the enforced investment resulting from the raising of large capital sums by enclosure and drainage commissioners should not be underestimated, for the returns to these capital improvements suggests an economic rationality in the use of funds and not simply an institutional or topographical determinism.

- 1 Billingsley,Agriculture of Somerset,p.34.
- 2 Thomas,'Agriculture and Industry in Nailsea',p.22, refers to petitions against enclosure in Clevedon,Long Ashton,and Wraxall,Nailsea,and Flax Bourton,1799-1813;E.C.K.Gonner,Common Land and Inclosure(1912),p.72, notes the opposition and defeat of a petition by the Bishop of Bath and Wells;and vol.1 of the 'Commissioners Proceedings of Meetings and Register of Claims,Manor of Bleadon', 1788, records the breaking down of 'Fences and Works erected on the Commons and Waste Lands', SRO,DD/FS,Box 67.
- 3 For example in the Blagdon Enclosure Award,SRO,Q/RDe 132, 1784-87 (the dates of the Act of Parliament and award),those receiving allotments in respect of their ancient tenement rights included several gentlemen,clergymen,widows,yeomen,and cordwainers,and an attorney,Doctor in Physic,surgeon,carpenter,shopkeeper,shoemaker,tallow chandler,glover,hosier,butcher,linen draper,tanner,tyler,clothier,miner and moorman.
- 4 Waste land enclosure was expressly excluded by J.M.Martin,'The Parliamentary Enclosure Movement',Agric.Hist.Rev.,15 (1967),p.24n., and by M.E.Turner,'Some Social and Economic Considerations of Parliamentary Enclosure in Buckinghamshire, 1738-1865' (unpub.Ph.D.thesis,Univ.of Sheffield,1973),p.90.
- 5 B.A.Holderness,'Agriculture,1770-1860',in Feinstein & Pollard,Studies in Capital Formation,pp.9-34,especially pp.21-3.
- 6 R.H.Tawney,The Agrarian Problem in the Sixteenth Century (1912),pp.262-3.
- 7 Michael Turner,English Parliamentary Enclosure,its Historical Geography and Economic History (Folkestone,1980),pp.86-93.
- 8 'The Proportion Roll of 1742',Somerset Record Soc.,3 (1889), pp.285-309,which stated the proportion to be paid by each parish to raise a tax of £100. The averages per 1,000 acres were: 3s.1d for the Levels, 2s.3d for the enclosed valleys south of the River Avon, and 1s.5d for the Mendips; J.D.Chambers & G.E. Mingay,The Agricultural Revolution 1750-1880 (1966),pp.83,110.
- 9 Martin,'The Cost of Parliamentary Enclosure in Warwickshire' in E.L.Jones ed.,Agriculture and Economic Growth in England, 1650-1815 (1967),pp.128-51; Turner,'Parliamentary Enclosure in Buckinghamshire'(1973), and 'The Cost of Parliamentary Enclosure in Buckinghamshire',Agric.Hist.Rev.,21(1973),pp.35-46.
- 10 Except for the parish of Cranmore awards for the region may be consulted at the Somerset Record Office. The Shipham and Winscombe Award,Q/RDe 13,1797-99,is the only one with accounts.
- 11 Evidence comes from the registers of gentry and professionals compiled in the course of this research.

12 SRO,Wookey Enclosure Award,Q/RDe 134,1782-86, and DD/S/CX, 'Proceedings of the Commissioners',1782-87; Weston-super-Mare Enclosure Award,Q/RDe 123,1810-15.

13 SRO,DD/FS,Box 67,'Bleaddon Inclosure 1788'. Three auctions were also held in the Wells enclosure of 1793-95. £11,319 was raised from the sale of 773 acres. SRO,Wells Enclosure Award, Q/RDe 81.

14 SRO,DD/BK,Correspondence and Papers; WSM,L00/53,S/W17/43, 'Commissioner's Proceedings', 'Commissioner's Accounts', and Sales Bills.

15 Billingsley,Agriculture of Somerset,p.31; Collinson,History of Somerset,II,pp.165-8; SRO,Yatton Enclosure Award, Q/RDe 3, 1751, Banwell Enclosure Award, Q/RDe 42,1795-97, and DD/FS, Box 67, 'Bleaddon Register of Claims', 1789.

16 The Cheddar,Priddy, & Rodney Stoke Enclosure Award,Q/RDe 33, 1811-21, notes that by 51 Geo.III the cost of exchanges, and by 56 Geo.III the cost of surveys, was to be borne by interested proprietors. In the present case the cost of £2,870 was to be met by an Exchange Rate included in the award.

17 BAO,01097(5)g. A letter of Dec.1809 shows that the Portbury commoners were aware of this cost, for they complained that the commissioners had sold '102 acres of the best land in the wharf leaving only 156 to be divided'.

18 Chambers & Mingay, Agricultural Revolution, pp.83,110.

19 SRO,DD/BK,Correspondence & Papers; and WSM,L00/53,S/W17/43. Small but costly plots of land advertized as having no barrier to the sea were bought by John Coulson, Thomas Lyddon, and Edward Stephens (an attorney), gentlemen of Bristol.

20 Examples include: the Rev.Thomas Sedgwick Whalley D.D.of Langford Court,Burrington,in Commissions of the Peace from 1794 to 1814, married to the daughter of Bristol merchant Edward Jones, who bought 41 acres in the Banwell enclosure (1795-7); Edward Spencer of Wells,surgeon and apothecary, who bought land totalling 290 acres for £1,827 in enclosures at Cheddar(1795-1801), Shipham and Winscombe (1797- 99), and Weston-super-Mare (1810-15); Thomas Keedwell of Barrow, attorney, who bought 46 acres in the Backwell enclosure (1807-12) to which he was a witness. Whether for himself or a client cannot be determined, but he also bought an estate at Blagdon, then sold to John Billingsley; and John Thomas an innkeeper of Road who bought 20 acres in that enclosure (1790-92).

21 For example Richard Perkins of Oakhill,gent.,a partner with John Billingsley in the brewery there (PRO,E112/1929/282,1775), was commissioner at 4 enclosures including that at Wells (1792-94) in which he purchased land for £155;John Verry of Bristol,a

surveyor at 5 enclosures including Portbury (1798-until he died in 1801) in which he bought 5 acres for £182; Thomas Curtis, carpenter, undertook work in the Wookey, Bleadon, and Blagdon enclosures in the 1780s, receiving an allotment in the last-named, in which he also purchased 64 acres in 3 lots for £422.

22 Sidney & Beatrice Webb, Statutory Authorities for Special Purposes(1922,repr.1963, pp.39-45; Michael Williams, The Draining of the Somerset Levels(Cambridge,1970).

23 SRO,D/RA AD 5,Somersetshire Sewers,Axbridge Division. A vol. of minutes for 1790-1825, records works undertaken (for example the repair in Nov.1800 of hatches put up by a jury to prevent an inflow of saltwater), and the rates raised to meet costs.

24 SRO,Q/RDe 134 (1782-86),the Wookey Award for example concluded with a schedule of rates for 'defraying the costs charges and expences of new making maintaining and repairing the several and respective private roads or droveways Gates Posts Barrs Drains Watercourses Bridges Tunnells or Sluices ...to be made built created and laid down in the said Row Moor'.

25 SRO,D/RA AD 4, 'Case with Mr.Goodden's Opinion',11 Oct.1800. Also consulted were Messrs. Law, Gibbs, and Dampier, in 1800-01.

26 SRO,D/RA AD 5,Vol.of Mins.1790-1825,20 July & 20 Oct.,1801.

27 SRO,D/RA SW 11,Two cases were submitted for 'the opinion of Counsr Moore' by John Conway of Wells, solicitor to the Commissioners of Sewers, 30 June & 18 Nov.1812.

28 SRO,D/RA SW 11, Letter from Young Sturge to J.Conway, 22 Feb. 1812; Mr.Moore's opinion was given 11 Dec.1812.

29 Francis Edwards Whalley esq.of Winscombe was a commissioner of 8 enclosures 1775-1806, the Axe Drainage 1802-10, and of the Court of Sewers for the Axe Division; Young Sturge,of the Bristol family of surveyors was a commissioner of 5 enclosures 1807-1820,and of the Weston Drainage 1810-15, and surveyor at the Congresbury Drainage 1819-26; William White of Wedmore was surveyor at 8 enclosures 1777-1801,commissioner of two 1809-16,and worked on both the Axe and Weston Drainages; Samuel Baker was involved in 13 enclosures from the late 1790s to 1820 (including the Congresbury), and the Axe and Congresbury Drainages.

30 SRO,D/RA AD 4, Letter from Messiters Bank of Wells,28 June 1802, soliciting the treasuryship of the Axe Drainage in return for 'every accommodation in our power'; BAO,01105(7),'The Commissioners of the Weston Drainage to Hall and Leman' 1809-12; SRO,D/RA SW 11,'Proceedings under the Congresbury Drainage Act 1810-15', 22 Oct.1820 and 27 Aug.1821.

31 SRO,D/RA AD 4, Loose papers of the Axe Drainage show that in 1805 the 'Quality men' received 5d per acre for 'viewing

valuing assessing and making out Rates', and the surveyors 6d per acre for 'measuring planing and levelling'.

32 SRO,D/RA AD 4, An undated estimate for the construction of a bridge at Bleadon under the Axe Drainage proposed a charge of £4,155, which included 25 per cent for unforeseen circumstances; Q/RDe 104,Axe Drainage Award.

33 SRO,Q/RDe 52, Weston Drainage Award and D/RA SW 11, 'Commissioners' Proceedings' 1810-15 and correspondence; BAO,00545(1-9), Property Deeds, Portishead, 1755-1814.

34 SRO Q/RDe 139, Congresbury Drainage Award and D/RDe SW 11 for 'Commissioner's Accounts'.

35 See Chambers & Mingay,Agricultural Revolution,pp.20-1,200-1, and Holderness,'Capital Formation in Agriculture',pp.176-7; although F.M.L.Thompson,English Landed Society in the Nineteenth Century(1962),pp.226-9, has noted the importance of timing, as the eighteenth century move to a clearer demarcation between landlord's and tenant's capital became blurred during the war years, though re-established after 1815.

36 See details in the Axe Drainage Act, 42 Geo.III, pp.22-7.

37 SRO D/RDe AD 5,'Rate Book'.

38 SRO D/RA SW 3,Bundle A; & D/RA SW 11,letter of 15 Aug.1812.

39 For example, SRO D/RA SW 11, the 'Proceedings under the Congresbury Drainage Act', pp.24-5, set out the proportion of the rate to be paid by lessor and lessee respectively.

40 Holderness,'Capital Formation in Agriculture',pp.167-8.

41 Billingsley,Agriculture of Somerset,pp.57-8,62-89; also his 'Essay on the Best Method of Inclosing...Waste-Lands',Letters and Papers of the Bath and West of England Society,XI(1807), p.246; and editorial comment on his 'Remarks on the Utility of the Bath and West of England Society' in the same journal,X (1805),p.27; T.D.Acland,'On the Farming of Somersetshire',Jnl. Roy.Agric.Soc.,XI(1850),p.146; Williams,'The Enclosure and Reclamation of the Mendip Hills,1770-1870',Agric.Hist.Rev. 19(1971),pp.75-8.

42 Billingsley,Agriculture of Somerset,pp.77,90-106; also his 'Essay on Waste Lands',pp.43,73-7, and 'On the Culture of Potatoes',Annals of Agriculture,XXI(1793),pp.1-52; and editorial comments on his 'Bath and West Society',p.246; Acland,Farming of Somerset,pp.74-5; D.C.Findlay,The Soils of the Mendip District of Somerset(Harpenden,1965)pp.54-67.

43 Billingsley,Agriculture of Somerset,pp.57-8.

44 Ibid., pp.34,44,173-88,204-05; Acland,Farming of Somerset, pp.51-2,78,141; Findlay,Soils of Mendip, pp.109-27.

45 Billingsley,Agriculture of Somerset, pp.57,62,173-7; and his 'Essay on Waste-Lands', pp.29-30; BAO,01103, 'Folio 26, 3 June 1808, New Farm at Northweston'; Williams,Draining the Somerset Levels, pp.188-96.

46 Billingsley,Agriculture of Somerset, pp.167,175-86.

47 Ibid., p.58, and 'Essay on Waste-Lands', pp.45-7.

48 Chambers & Mingay,The Agricultural Revolution, p.84; Thompson,English Landed Society, p.225.

49 For example, Billingsley,Agriculture of Somerset, pp.74-5.

50 Ibid., pp.184-6,204.

51 Billingsley,Agriculture of Somerset, pp.78,98,177-8. He encouraged upland farmers to follow mixed farming by growing 'but little corn ..To have a great breadth of turnips, cabbages, potatoes, vetches, artificial grasses, and consequently to maintain a great stock. To provide all necessary buildings for shelter in the winter, and for the purposes of making mountains of dung, which the large produce of straw will enable the occupier to do. If sheep be kept..let them be folded every night of the year. By these means, lands of this description may be carried on in a progressive state of improvement..'. Lowland farmers were in contrast encouraged to grow more corn on well-manured land, but instead 'the plough lies idle, and nineteen parts out of twenty remain in grass'; Williams, 'The 1801 Crop Returns for Somerset', Proc.Som.Arch.& Nat. Hist.Soc., 113(1969), pp.69-85; Acland,Farming of Somerset, p.73.

52 Williams,Draining the Somerset Levels, p.183.

53 Acland,Farming of Somerset, pp.731,762-3.

54 Thomas, 'Agriculture and Industry in Nailsea', p.33.

Chapter 7 Capital Investment in Mining

Investment in mining led to a growth of physical capital in terms of surface buildings and equipment, and underground shafts and tunnels, but the study of this process is made difficult by the fact that as Pollard has observed, few of the surviving records relate to capital formation itself. In pursuit of the subject he was able to consult over 600 colliery accounts, in 60 per cent of which most capital items could be identified. For north Somerset however, even these are hard to come by, and the evidence available consists largely of legal documents establishing the ownership of mining rights, their leasing out, and the formation of partnerships to work for minerals. Subject to close scrutiny however, these have proved to be informative on the process of investment in the mining not only of coal, but also of lead and calamine, two minerals neglected in national studies¹.

The need for a legal definition of mining rights, which extended the activities of attorneys into a further sphere, arose from the complications of ownership. The Crown's right to gold and silver (and its associate lead), had on Mendip been granted since mediaeval times to four Lords Royal in an arrangement that was further complicated by the customary rights of free miners. Manorial lords had the right to minerals under commons, waste, and copyhold land, and this was upheld during enclosures by the inclusion in awards of clauses

assuring their continuing or 'saving' right to mine, or to lease out rights in return for a freeshare. Freeholders had the right to minerals under their land which they also could work, lease out, or sell in a separation of surface and subsoil rights. The papers studied (including the enclosure awards), show that this framework formed the legal basis for mining in north Somerset. The capital and mining skills to develop this resource came from the partnerships that were formed, even amongst free leadminers.

Although the region was well-provided with minerals, until the mid-eighteenth century mining was chiefly associated with the Mendips, where lead and zinc ores were found in the carboniferous limestone and dolomitic (keuper) conglomerate of the uplands, and coal was mined in the eastern valleys. It is on the subsequent development of these three minerals, here and elsewhere in the region, that this study will focus.

i The Mining of Lead and Calamine.

Calamine, the carbonate ore of zinc, was not worked until the second half of the sixteenth century, but the early exploitation of the ores of lead or galena with their small quantities of silver made Mendip possibly the most ancient mining district in England². The centralized supervision of mining was established in mediaeval times by the division of

the Royal Forest into four Liberties, each under the jurisdiction of a Lord Royal who profited from mineral duties or 'lot', and from fines related to the laws and customs peculiar to Mendip. These revenues increased with the significant rise in output from the mid-sixteenth century, the lead mines reaching their productive peak between 1600 and 1670. They then began to decline but there was a compensatory rise in the extraction of calamine which was in its prime in the middle decades of the eighteenth century³.

The status of the freeminer was diminished by the creation of the Lords Royal able to assert their control through a right of soil rather than a local mining constitution, and although it was unlikely that a miner would be refused a licence to dig for mineral ores, and mines and shares in them continued to be regarded as assignable property with no time limit attached, these favourable conditions applied only on open common or wastes⁴. Elsewhere mining rights were granted for a specified period, in a pattern which was bound to resemble that operating elsewhere as Mendip commons were enclosed⁵. Despite these qualifications the independence of the miner was not illusory, and the mining field never became the monopoly of any one individual or firm. Most mines remained small scale ventures operated by free miners individually or with partners, although from Elizabethan times these came to include local gentry, tradesmen such as innkeepers, and Bristol merchants, as well as other free miners. Wage labour was employed. Rarely,

capitalists from outside the region like Bevis Bulmer and Thomas Bushell in the sixteenth and seventeenth centuries tried unsuccessfully to drain and extend the mines.

The decline in output by the end of the seventeenth century was largely the result of the intensity of earlier work which had exhausted the more accessible lodes, leaving only those that were subject to flooding. Baling with leather buckets was an inadequate answer to the problem, but it may be that the introduction of effective drainage was hampered less by a lack of funds than by the problem of their effective employment in an industry dominated by free miners, who preferred to continue a traditional way of life by seeking alternative outlets for their labour, rather than by coming to terms with their capital requirements. This attitude was fostered by the riches of Mendip which led Gough to comment 'there is scarcely a parish, from Bleadon and Hutton in the west to Binegar and Croscombe in the east, where mining for lead or some other metal has not taken place'⁶. Faced with a drainage problem, miners could either open up new sites for lead or search for other minerals, both of which allowed the emphasis to remain on labour rather than capital.

Calamine was the most profitable alternative mineral. It can be alloyed with copper to produce brass, but that industry was unknown in this country before the sixteenth century when the government, anxious that England should produce its own raw

materials for ordnance, encouraged German capitalists to invest in these untapped mineral resources. This encouragement led first to the mining of copper in Cumberland by the Mines Royal, incorporated in 1565, then to the formation of the Society of Mineral and Battery Works and the search for calamine. In 1566 this was discovered at Worle Hill, a Mendip outlier to the west of the main lead-producing region. By the seventeenth century mines had also been opened up on Broadfield Down, north of the main range, and at Shipham and Winscombe on Mendip itself. The Mines Royal Act of 1689 which ended the previously inhibiting monopolies and allowed the development of private companies, set the seal on the significance of these mines. One of the most important customers was the Bristol Brass Wire Company, founded 1702, but there was also a continuing demand from Birmingham as Mendip calamine was held to be the best in England. By the later eighteenth century the mines on Broadfield Down above Wrington had been abandoned, and Shipham and Rowberrow in western Mendip had become the two most important mining villages⁷. But more easterly workings in the Liberties of Harptree and Chewton continued to function throughout the eighteenth century, and it is for these areas that some documentary material has survived.

The survival of papers for these Liberties, in contrast to Wells and the West, is due largely to the continuity provided by the Waldegrave family of Chewton Mendip who were not only the ancient Lords Royal of Chewton, but whose purchase of the

Harptree estate in the early nineteenth century ensured the safety of evidence for that Liberty too⁸. A valuation of East Harptree in 1793 which emphasised that 'The principal part of the profits arise from Lapis Calaminaris which is found in pretty considerable quantities and a little Yellow Ochre which is found upon the common of Mendip. Some small quantity of lead has been found but these are very trifling...No coals have been found or worked here..', would have applied equally to the Chewton Liberty at that time except that coal had been mined in the eastern valleys of Mendip from at least the fifteenth century⁹. The fact that lead was no longer an important source of profit for miners or Lords Royal made no difference to the relations between them, for by an order of 1773 calamine and ochre were made subject to the payment of lot in the way that lead was charged, showing that the ancient rights of soil could be adapted to meet new circumstances¹⁰. With the roles of the participants regulated by tradition, by what process were the capital investment needs of mining on Mendip met?

The Lords Royal were responsible for the provision and maintenance of buildings at the 'minery' or headquarters to which ore was taken for cleaning, weighing, and processing. It was to their advantage to provide these items of fixed capital, for the produce of an otherwise dispersed industry was then concentrated in one place under the supervision of the lead reeve, easing the task of collecting the lot. The location of the four mineries was determined largely by the availability of

water on the dry uplands, for before the lead ore was smelted or the calamine calcined it had to be washed in 'buddles' which, judging by the work undertaken regularly at the Chewton minery, were more than simple troughs by the second half of the eighteenth century. In 1768 for example a wall was built around them; in 1771 a carpenter put in posts and a door of new oak and righted the 'Eyre Gate'; and an account in 1776 shows they were then substantial buildings with thatched rafters and locked doors, to which water was conveyed through elm conduits¹¹. The absence of any mention of furnaces for smelting lead or ovens for calcining calamine suggests that both were by then being undertaken in Bristol where coal was cheap and accessible. This move would not have diminished the control by the Lords Royal, who continued to safeguard their lot by providing the items of fixed capital required for washing and weighing the ore.

Hidden behind their imposing title and hereditary rights of soil were four representatives of the different influences upon the economy and society of north Somerset. They included the Bishops^{of} Bath and Wells, whose extensive lands gave influence over agricultural as well as mining developments; the Gores of the West Liberty, wealthy London merchants who bought the manor of Barrow Gurney in the mid-seventeenth century, and confirmed their position as Somerset gentry by marrying into the Smythe and Langton families; the Scropes of Harptree, representing the Bristol link, where their fortune was founded in the first half

of the eighteenth century on law, politics, and merchant riches by marriage; and the Waldegraves, granted the manor of Chewton by the Crown in the mid-sixteenth century, but absent from the region in person and influence for the next three hundred years. All relied greatly on their representatives in the mineries, men such as George Pope who was an active mine partner as well as Scrope's agent in Harptree, and Robert Wright who was an important freeholder in East Harptree and the Waldegrave agent for six manors of which the most important were Chewton and Radstock. He is already familiar as a commissioner in seven local enclosures from 1775 to 1791 (twice as banker), in which he was able to ensure the continuity of mining rights for Lords both Royal and of the Manor. For over thirty years from 1764 he accounted at Michaelmas to the Waldegraves for the 'Rents, Issues and Profits' of their lands, benefiting in the intervals from the use of these funds. Wright's accounts show the generally low returns from lead lot, though there was a rise from an average of £20 per year in the 1760s to £30 per year in the 1770s, with an eventual decline to less than £8 per year in the 1780s. There was some compensation from calamine and yellow ochre, but the most dramatic growth was in revenue from the coal mines at Radstock for which the Lord's freeshare in the 1780s (when this revenue was first recorded), grew from £86 in 1780 to £700 in 1789, averaging £463 per year over the decade. All moneys were remitted by bill to Messrs. Drummond in London¹².

Evidence on the part played by miners may be found in a notebook for 1773-1810 kept by the lead reeve for the Chewton Minery, John York. He was both an active miner, named regularly in partnership with others, and a farmer to whom land was allotted in the Chewton Mendip enclosure award of 1800 in which he was described as a yeoman of that place¹³. Information from this source is set out in Table 7(1), where column I shows how few asked 'leave to work and mine on the Forrest of Mendip within the manor of Chewtonaccording to the Customs and Orders of the Forrest' in the last quarter of the eighteenth century. But amongst those already licensed there was considerable activity. Column II reveals the number of claims registered. The way these clustered around particular sites such as Red Quar or Green Oar shows the need for a clear demarcation of rights. The intermixing of pitches led to the exchanges listed in column IV, to consolidate scattered holdings. Not all claims related to untried ground, and column III records those for old, abandoned grooves or gruffs, for example Tilt Gruff in 1778. Columns V and VI record agreements already made, some relating to partnerships of extreme complexity, such as one with 10 partners and 15 shares¹⁴.

Evidence on the sale of rights to pitches and grooves in column VI provides interesting though limited information on the capital employed in mining. In 1785 for example a quarter part of a gruff and pitches at Drappers 'now working for Callamnie...Together with Callamnie Tools and everything

Table 7(1): Lead and Calamine Mining in the Liberty of Chewton, 1773-1810

	I	II	III	IV	V	VI
Year	Licences Granted	Claims to Pitches	Claims to Grooves	Exchange of Rights	Partnerships Notified	Sale of Pitches and Grooves
1773		3 (45)		1		5
1774		4 (80)		1		9
1775		3 (25)				1
1776		2 (8)				
1777	2	3 (46)				1
1778		7 (70)	4 (6)			
1779		5 (117)				
1780						
1781		3 (50)	2 (4)		1	5
1782		4 (19)	1 (2)	3		1
1783	1	5 (41)	4 (4)			1
1784		1 (12)		1		
1785				1		3
1786		3 (60)				3
1787		2 (29)		1	1	4
1788		2 (8)	1 (1)	1		3
1789		1 (5)	1 (2)	1	1	7
1790		2 (31)				
1792		5 (60)	2 (2)			
1793						
1794		3 (43)				
1795						
1796		2 (825)		1		
1803		2 (105)				
1810		Memo of 1803 affirmed				

Source: S.R.O. DD/WG Box 15. "Mining Memorandum Book, 1773-1810", a record maintained by the lead reeve.

- NOTES: 1 Pitches were untried land, but grooves or gruffs were mines once opened up but later probably abandoned. The figures in brackets show the number of pitches or grooves to which claim was being made.
- 2 The table ends effectively in 1803, the entry for 1810 being a confirmation of the Wells Mining Company's claim to 100 pitches, registered earlier. This had followed the claim to 800 pitches, made in 1796.

thereunto belonging right title and claim whatsoever...' was sold for ten guineas, indicating a total value for this productive mine of 40gns. A clue to the relative value of the mine as against its equipment comes from a case tried before the Mineral Grand Jury of Chewton Liberty in October 1783. John Jacobs claimed he had been denied his quarter share in a calamine works near Green Ore, despite paying the partners 1gn for the same, plus £11.12s.3½d for candles, timber, tools, and necessaries. The overall value of the venture was thus at that point £50.13s.2d, of which the mine itself and the right to work it represented 8.3 per cent of the total, and the working materials 91.7 per cent. As Mendip mines remained simple because the shortage of funds, it is likely that fixed capital always formed a small part of total outlay¹⁵.

John Jacob may be selected as an example of the men named in these records. In the 1780s he is noted simply as 'of Shipham', but the enclosure award of 1799 for that Mendip parish refers to him as a gentleman entitled to an allotment, who also purchased nearly 100 acres in 6 lots for £465. He had either prospered in the intervening time or he had earlier been a non-working partner in the mining venture. Either is possible for gentle and professional men were frequently included in partnerships as well as free working miners, especially towards the end of the eighteenth century. In two partnerships recorded in 1793 for example, working the Engine and 'all Eights' mines respectively, the former had four working miners out of nine

named, and the latter had four out of ten. As the working miners provided only one-quarter of the capital in the first case, and one-eighth in the second, their contribution of small funds and ancient rights had to be backed up by resources from outside the mining industry. Of the gentry, professionals, yeomen, and tradesmen named in the period from the 1770s to the early nineteenth century, special mention may be made of old colleagues associated in many undertakings, John Billingsley and Richard Perkins, and the attorney William Miles¹⁶.

By the end of the eighteenth century even these mixed partnerships were finding it difficult to cope with drainage problems, especially as the solutions put forward like Billingsley's scheme for a great level from Compton Martin to Wookey Hole would have required a large capital input¹⁷. Some attempt was therefore made to establish large enterprises on resources from outside the region. In 1796 George Watson and Philip George of Bristol, a North American merchant and the owner of a spelter works respectively, set up a partnership with some 30 others to work for lead and calamine at Small Pits; in the same year, and again in 1803 and 1810, the Wells Mining Company laid claim to 800 pitches; and in 1798 an agent of the Birmingham Company was seen prospecting at Rowberrow. These may have been attempts to safeguard Bristol's supplies, sent directly for example to the brass works of Messrs. Champion in the 1760s. But although there are records of deliveries from the Harptree Liberty to Philip George's works at Hanham from

1804 and to the Baptist Mills brass works from 1805, mining was so badly affected by the reduction of import duties in the 1820s that that on Mendip began to fail. One new venture in 1822 is worth mentioning for it was at Wigmore Farm, a post-enclosure creation studied in the previous chapter¹⁸.

Finally, what were the markets served? When lead ore was smelted on Mendip, customers from for example the cathedral at Wells, the parish church at Yatton, and the Corporation at Bath, bought direct from the mineries. But even then dealers were active, buying and transporting lead to Bristol for smelting before making up into sheets and pipes or other uses. Mendip lead was particularly suitable for lead shot and in the 1780s an improved method of manufacture was pioneered in the city. Lead was also an important element in the making of pewter ware. When Mendip supplies failed lead had to be imported into Bristol, but local calamine continued to be used in the making of brass wire and domestic utensils¹⁹. In one respect lead and calamine made a similar contribution to the local economy, for as will be seen they were made into low grade barter goods for use in the Africa trade. The Bristol link has also produced a rare reference to a connection between mining and banks, for some of the Harptree Minery papers concern Messrs. Harford, 1802-09, and a later steward James McMurtrie has added the note that 'The names of many of the mining partners appear'²⁰.

ii Coal Mining in North Somerset

Although the exploitation of this coalfield depended basically on its geology, which governed the availability of the mineral, the pattern of development was strongly influenced by factors described already in relation to the mining of lead and calamine. These are the system of landholding and mining rights that controlled access to the mineral, and the use of the partnership as a vehicle for the provision of mining capital and management expertise.

The coal-bearing measures are bedded on older carboniferous limestone rocks, and overlaid by newer sandstones and clays, and within this sandwich they are themselves divided into upper and lower measures, separated by pennant sandstone. The lower were exploited first as they were made accessible by the upthrust of the older rocks to form the Mendip and Clevedon hills, with an angle of inclination so severe in some parts like the Nettlebridge Valley, that vertical seams were mined²¹. This small-scale mining grew, with developments in the parishes of eastern Mendip in the mid-seventeenth century, and in those such as Clapton-in-Gordano, Nailsea, and Brislington near Bristol, and Corston and Newton St. Loe near Bath, in the following years²². In the centre of this north Somerset saucer, part of the upper series could also be worked with relative ease in an area south from Chewton and Keynsham, by Compton Dando, Publow, Pensford and Chelwood, to Bishop Sutton, Clutton

and High Littleton, ending at Farrington Gurney. Further to the southeast it was obscured by surface rocks but its existence was long suspected, and explorations led to the sinking of the Old Pit in 1763 and the development of the highly profitable Radstock-Camerton area²³.

For the main part of the coalfield where the upper series was exploited there was growing prosperity in the second half of the eighteenth century. This was in contrast to the Mendip pits, which were in relative decline because although retaining their markets in the southeast of the region (like Frome) and in the nearer parts of Wiltshire and Dorset, they were not well-placed to serve the growing needs of Bath. These were instead largely met by the newer High Littleton-Farrington Gurney and Radstock-Camerton pits, their coal carried on the roads of the Bath Trust. The building of local canals in the early nineteenth century further increased their advantages. Despite the early stimulus noted, Bristol was not a good market for north Somerset coal because of the close proximity of the Kingswood field²⁴. But there was a growing domestic market within the region, and coal was also in demand for agricultural and industrial purposes such as lime-burning, the drying of brewers' malt, and iron- and glass- making. Later, coal was used for town gas.

Billingsley observed in the mid-1790s that the 26 coalworks in the main part of the field employed about 1,500 men and boys

and produced 1,500 to 2,000 tons per week (78,000 to 104,000 tons annually). This suggests an average annual output of from 3,000 to 4,000 tons per pit. The southern or Mendip parishes employed 500 to 600 men and boys and produced 800 to 1,000 tons per week (41,600 to 52,000 tons annually), which Billingsley thought could be raised to 2,000 tons per week 'if sale could be found'. The importance of markets is further demonstrated by developments in the north west of the region. At Nailsea for example the growth of mining at the end of the century was associated with the establishment of glass works in 1788. These pits produced 2,500 bushels daily (possibly 38,500 tons annually), and if five or six were then in operation, as seems likely, their average annual output probably exceeded that elsewhere in north Somerset. At the nearby pit at Clapton the average annual output of 3,700 tons was more in line with the main part of the coalfield. Again there was a specific outlet in addition to the domestic, in this case for lime burning in a market which included Wales because of the proximity of Portishead²⁵. These figures suggest an output for the north Somerset coalfield by the mid-1790s of between 160,000 and 200,000 tons per year, not including pits mentioned earlier but omitted by Billingsley, at Bedminster and Brislington near Bristol, and at Newton St.Loe near Bath.

Billingsley's views were those of a knowledgeable local man with a practical interest in coal, for he was a partner in this as in lead mining. His figures are echoed by later estimates,

for annual outputs of 140,000 tons in the 1780s and and 210,000 tons in 1800 were suggested by Nef and Flinn respectively²⁶. Such calculations are important because output figures are used by Pollard as the basis for estimations of capital formation in coal mining, although the procedures adopted for this region are unclear as he moves without explanation from the figure of 147,000 tons for 1799 for Somerset and Devon, to that of 400,000 tons as a ^{quinquennial}~~decadal~~ average for the ^{years}~~1791-5~~ for Bristol including Somerset. It has been noted that Pollard also uses the evidence of costs from 622 accounts to discover appropriate capital/output ratios, but little is available of this nature in Somerset. However the one account book uncovered by this research does provide rare evidence on original sinking costs which are acknowledged by Pollard to be understated in his work as therefore are estimates of capital formation in new mines²⁷.

Before studying this evidence on capital investment it is appropriate to consider the organization of the industry in north Somerset. In the absence of great territorial magnates, landowners usually chose not to exploit coal reserves on their estates themselves, but to lease out these rights to local partnerships in which they were sometimes included. The partners bore the costs of investment and paid the landowner a free share ~~based~~ of the produce of the mine, usually 1/8th or 1/10th, based on either the coal landed or the money received from its sale. It was akin to the lot on lead as is shown by the Waldegrave accounts already referred to which record for

the 1780s the payments of duties to the Earl - on coal as Lord of the Manor, and on lead as Lord Royal of Chewton Minery. The first known grant of exploration rights by the Waldegraves was in 1749 to James Lansdown and partners, but coal was not found in significant quantities until the Old Pit was sunk in 1763 followed by the even more lucrative Middle Pit in 1779. The Waldegraves continued to benefit from freeshare whilst the partners, seven by 1776 including Robert Wright of Harptree, put up the capital and carried the risks. In the first year of nearby Ludlow's Pit for example, 1782-3, this involved £900. As the mines became profitable the balance of advantage moved against the leasing of rights, but the adjustment implied was so much against the tradition of the coalfield it was not achieved by the Waldegraves until 1847, when the lessees were removed by court action. But this move to full ownership held dangers, for by the time the Pophams of Hunstrete House at Marksbury had assumed control of the Heighgrove pits at Farmborough in 1819, in the only other case known, the mines had ceased to be profitable²⁸.

Mining agreements and leases reveal some recurring names in different and interlocking combinations, as well as others to be found less frequently. Amongst the most familiar were gentlemen such as James Stephens of Camerton, Samborne Palmer of Timsbury, the Savage family of the Midsomer Norton-Paulton area, the James family of Welton, and most importantly the brothers John and Jacob Mogg of Farrington Gurney and High

Littleton. All played an important part in mining developments, primarily as entrepreneurs and only secondarily or incidentally as landowners. Jacob Mogg was the outstanding coalmaster of the second half of the eighteenth century, but none of the ventures in which he was involved was on his own land, contrary to Flinn's generalization which links him incongruously with Lords Ferrers and Dudley in the development of mines on his estate. Instead, all were undertaken by a lease of mining rights from other landowners who may have lacked either the resources or the inclination to become a sole developer, though willing to join a partnership. In the mid-eighteenth century these were usually made up of five or six partners, though that number may be doubled in later decades, possibly as capital needs grew. But for the Timsbury partnership founded in 1791 and the most successful combination of all, six was still deemed an effective number²⁹.

An analysis of the partnerships is hindered by uncertainties about the totals involved, but from the sources consulted a register of some 132 partners has been compiled. 65 per cent were gentry, including a few yeomen; 15 per cent were tradesmen and professionals; 11 per cent were Bristol merchants; and 9 per cent were working men of whom most but not all were miners. Colliers were particularly important in early partnerships like that of 1719 to explore land owned by John Strachey of Sutton Court in Bishop Sutton. This practical venture involved three yeomen, two coalminers, and a blacksmith, and the year the

lease was granted the landowner published his own observations on the stratification of local rocks³⁰. The number of coal-miner partners diminished over the years (the last encountered being in a lease of 1793), but this may have been due to a rise in status as their practical skills became recognized, especially before professional surveyors were used. William Smith, for example, later to achieve fame as 'The Father of English Geology', was not employed in the coalfield until 1792 when he surveyed Mearns Colliery at High Littleton³¹. The Bush and Crang families provide evidence of this rising status, for having started as miners they had become managers or managing partners by the 1760s and 1770s, and were then designated gentlemen. This development suggests an important difference between this region and those where mines were exploited by estate owners, where it was common practice for fixed capital to come from the landowner and his partners if any, whilst working capital was provided through the 'butty system' by a charter master who managed the mine. But in north Somerset where the landowner had no responsibility for the provision of capital, and the partners provided both fixed and circulating forms, mining was conducted by working partners or managers with practical coal mining experience³².

In illustration of other non-gentry sources of capital around for example the decades at the turn of the century, the cases of a carpenter, brewer, apothecary, and surgeon may be noted, together with the surveyor Thomas Davis yr. from Longleat, and

the attorney/bankers Uriah and George Messiter of Wells. The Rev. Alexander Adams of Belluton was one of the clergy involved. He succeeded to his father's interest at Mearns, and was also a Timsbury partner from 1793 with an 8/64 share under the will of his uncle William Bush. This illustrates the significance of connections in this region. Family ties have been mentioned, but links with other forms of economic activity were important. For example Jacob Mogg's work as a trustee of the Bath Roads had a direct bearing on the fortunes of mining, for he was responsible for the building of a much-needed new road. James Stephens of Camerton, landowner (with a concern for the Axe Drainage) and mining partner, was a leading promoter of the Somerset Coal Canal and its first chairman in 1794. The work of enclosure commissioners such as William Kelson of Midsomer Norton, a Welton partner from the 1790s, was also relevant, for they oversaw the 'saving' of mining rights in lands enclosed.

In the main part of the coalfield few partners came from beyond the region, but the Bristol influence was strong on the northern fringes. In 1754 land at Bedminster was leased for coalmining to Jarrit Smith, attorney, Job Charlton, merchant, and George Lewis, stationer, all of Bristol, in partnership with Richard Warren esq. of that parish, and William Harrington of Newton St. Loe, gent. In 1756 mining rights in Brislington were leased to a trio from Bristol made up of two merchants and a tiler. By 1763 Jarrit Smith was a baronet but his interest in business was undiminished, for in that year he corresponded

with Alexander Colston, landowner and descendant by marriage of the great benefactor, on the use of gunpowder in mines. Three years later Colston granted a coal lease in Clapton to Gabriel Wayne, active in the Bristol copper industry and associated with the adaptation of the coal-fired reverberatory furnace from lead to copper smelting. The focus of the Langtons, Bristol merchants, shifted towards Bath with the purchase of Newton St.Loe, and in 1772 they bought coal works from the Harringtons whose interests in Bedminster was noted above. By 1802 they had been leased to a partnership of five composed of Zachary Bayly and his son Nathaniel of Bath, attorneys and former bankers; Edward Spencer, leading tenant farmer of Newton; Moses Reynolds of Brislington; and Robert Bryant of Bath, malster. Here was a mix of entrepreneurial spirit, local roots, lands or mines in other parishes, and trade links, for Newton coke was used for drying malt³⁹. Although the Bristol connection brought in new sources of capital, the northern fringe resembled the rest of the coalfield in other respects, as landowners chose to lease coalmining rights to the members of interlocking partnerships, rather than to undertake the exploitation themselves.

It has proved difficult to value the shares held by different partners. In 1781 for example, before his Newton venture, Zachary Bayly had a 8/22 share in the Old Pit at Camerton, but unfortunately no figures can be attached to that proportion. However, access to the Timsbury Notebooks in the 1950s enabled Bulley to record that the cost of original work

at Upper Conygre, opened at Timsbury in 1791 and met by six shareholders, was £7,200. In the same year a partnership was formed to sink pits at New Tynning and New Grove in the Paulton basin. William Crang's share, probably $\frac{1}{8}$, was sold in 1801 for £1,500, so £12,000 may have been invested in the two mines. In 1803 the Rev.B.D.Smith was assigned a $\frac{1}{8}$ share in Hayeswood mine where a new partnership was at work from 1792. At £800, a subscription of £6,400 is suggested, but this may be an accumulated figure after a decade of development³⁴. Similarly with a coal works in Radstock, whose estimated original capital costs of £6,048 had risen to £18,144 by 1792, when the share of one of seven partners was assigned³⁵.

Bulley concluded that between 1760 and 1830 the capital required for a colliery undertaking in this region was between £2,500 and £10,000. This accords with the framework of costs devised by Griffin for the years 1780 to 1840, based on the recognition that mines would differ by time and place rather than by a precise chronological sequence. A simple bell pit would need little capital, perhaps £40; a relatively shallow mine with two shafts each 60 yards deep, drainage levels, whim gin and surface buildings may cost £1,730; with steam power for drainage and possibly winding, costs could rise to £3,200; and for large deep mines using steam power widely and with a range of buildings and transport network, costs could be between £6,000 and £50,000. Flinn notes a colliery in the north east where in 1755 total sinking costs including drainage were

£2,160. Pollard's classification into only three groups of undertakings is too broad to be useful, but his categorization of capital items found in accounts is more helpful, for it shows that some apparently trivial items were important in the larger scheme of investment. But it is to be regretted that gunpowder, important to coal mining in general and the economy of north Somerset in particular, is not listed there³⁶.

The process by which the partners' investment capital was incorporated in fixed assets in mining may be examined for this region only through the simple account book of the Farrington Pit for the years 1779 to 1790. This single entry running record shows items of weekly expenditure and income. Payments for rent and trespass enable the venture to be located by field names on a site northeast of the church at Farrington Gurney³⁷. The proprietors were Jacob Mogg, the dominant coalmaster in the region at this time, and two sleeping partners, John Gaby and Ralph Hale Gaby from Wiltshire, respectively gentleman and attorney. They held a lease of coalmining rights dated 1779, a renewal of one of 1770. The first years at Farrington were unproductive but the mine survived and was not closed down until 1922, a family interest having been retained to the mid-nineteenth century³⁸.

For Jacob Mogg the Farrington pit was only one of many interests in the coalfield, which had begun with a mine at Welton on a lease first granted by the Duchy of Cornwall in

1756. By the 1760s he was active in the manor of Timsbury. His interest in Farrington Gurney from 1770 has been noted. This was the family base, where in 1663 Richard Mogg, bailiff to the Duchy, secured a coal lease, ~~in 1663~~. In the 1770s Jacob Mogg also became established in High Littleton, as a leading partner at the Heighgrove Colliery. He had a 7/32 share in the nearby Mearns Colliery by at least 1783. The 1780s saw his interests extending south to the Nettlebridge Valley, where a lease was again negotiated with the Duchy of Cornwall. The shaft at Old Rock was probably sunk in 1786, and the mine was worked until the 1870s. By the 1790s the pattern of interlocking partnerships sustaining Jacob Mogg and his associates was becoming better defined. In 1792 mining activities in Welton, and in 1793 those in Timsbury were consolidated by formal articles which pooled separately-held coal rights and created 'a Capital or Joint Stock'. But despite this suggestion of a new form, that of the partnership was retained, though more substantial and consolidated than before³⁹.

This diversity of interests in different partnerships and mines formed the structure which supported investors in the uncertain business of coalmining. At the Farrington Pit for example, the balance frequently read 'out this week' so that the monthly reckoning was often 'Book in Debt', and in spite of fluctuating gains throughout the period the enterprise had an accounting debt of £1,750 by 1790. However the evaluation of profit and loss was not a concern of these accounts, which

simply recorded fully and unselectively the transactions associated with the undertaking. They were in fact an arithmetical exercise which would help a busy coalmaster to conduct his business in an orderly fashion, but not to assess its profitability.

Evidence from the accounts has been assembled in Table 7(2) and analysed in 7(3) and 7(4). Expenditure in the years 1779-90 by the three partners totalled £3,677, but this does not represent fixed capital investment for both the freeshare and revenue from sales show that some coal was sold in that time. Fortunately there is enough detail to encourage an attempt to separate the fixed capital formation costs from those involved in extracting coal whilst the mine was being established. The outcome is shown in Table 7(4), which reveals the disposition of both the overall expenditure (£3,677) and the probable cost of sinking the mine (£2,000). In calculating the latter, payment for general day work has been excluded from the labour costs which then comprise the bargains (specific undertakings to sink shafts, drive levels and branches), and payments to masons, sawyers, and hauliers who carted raw materials and rubble but not coal. Materials like candles and powder are included in full because of the difficulty of distinguishing between their use in mining and sinking. Of administrative costs, rent and trespass are included because the venture could not have been undertaken without them. Miscellaneous costs are taken in full as they included assets like the winding drum.

Table 7(2) Part I: Expenditure at the Farrington Coal Pit, January 1779 - November 1790

Year	Labour Costs. Columns 1 - 5							Material Costs. Columns 6 - 15										
	1 Daywork	2 Bargains	3 Mason	4 Sawyer	5 Haulier	Total Cost of Labour		6 Timber (Trees, boards)	7 Lugs	8 Brushwood	9 Rods and Reed	10 Stones and Lime	11 Nails					
	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d
1779	92 17 6	59 16 6		0 18 8	0 6 0	153 18 8		6 17 9	19 7 0	0 1 0	0 16 0		0 12 1					
1780	146 16 11	95 18 11		5 6 3½	7 15 4	255 17 5½		3 4 10	13 14 6	0 3 0	0 17 6		0 11 10					
1781	110 18 0	131 0 4		6 13 5½	16 2 4	264 14 1½		19 9 2	13 10 0	0 6 0	0 9 8	0 16 4	1 7 10½					
1782	136 8 9	130 7 2	4 5 4½	6 3 11	10 3 0	287 8 2½		1 16 0	16 7 0	0 17 6	0 7 2	4 10 6	0 18 9					
1783	120 2 1	105 10 1½	5 13 11	5 7 2	9 1 0	245 14 3½		4 1 8	2 18 0	0 9 4	1 17 10	2 12 0	1 5 0					
1784	64 6 2	111 8 9	11 10 10	9 6 5	20 10 4	217 2 6		12 13 3½	16 16 0	0 4 2	2 12 8	2 11 8	0 19 2					
1785	39 14 5½	99 19 2		3 3 1	16 6 3	159 2 11½		2 3 8	25 16 8	0 8 0	0 4 7	4 2 0	1 5 11					
1786	123 13 10	20 5 10		1 10 0		145 9 8		5 17 6	18 4 0		0 7 8	0 9 0	0 8 0½					
1787	136 5 5	93 17 7		5 19 2	1 0 0	237 2 2		2 19 0	11 4 0	0 6 0	0 4 10	1 5 3	0 18 1					
1788	159 5 0	39 13 10		1 18 6		200 17 4		4 6 6	23 6 6		0 12 0	0 6 0	0 14 10					
1789	132 9 4	28 17 4	2 11 0	2 13 3		166 10 11		3 0 0	15 16 0		0 9 2	0 1 0						
1790	145 0 3	33 16 0		2 9 7	12 3 0	193 8 10		7 5 0			0 17 2	0 6 6	0 16 6					
Total	1,407 17 8½	950 11 6½	24 1 1½	51 9 6	93 7 3	2,527 7 1½		73 14 4½	176 19 8	2 15 0	9 16 3	16 14 2	9 18 1					

Table 7(2) Part II

Year	Material Costs Columns 6-15										Administrative Costs. Columns 16-19					20 Misc- ellan- eous Costs	Total Annual Expenditure
	12 Candles	13 Powder	14 Rope	15 Iron	Total Cost of Materials		16 Rents and Trespass	17 Poor Rate	18 Audit Fee	19 Freeshare at ¼	Total Cost of Admin- istration		20 Misc- ellan- eous Costs	Total		£ s d	£ s d
	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d		
1779	12 13 10	11 9 3	3 6 1	11 10 6	66 13 6	34 9 0	0 17 3	2 15 6	14 10 2½	52 12 11½	1 10 11		274 16 0½				
1780	13 7 6	11 10 9	1 14 10	21 12 8	67 7 5	15 9 0	1 1 0		21 5 9	37 15 9	16 7 11		377 8 6½				
1781	14 0 0	24 18 3	6 13 8	17 19 3½	99 10 3	1 7 6	1 4 4	3 1 6	8 5 7½	13 18 11½	10 0 6½		388 3 10½				
1782	18 15 0	5 9 4	3 14 0	13 8 9	66 4 0	16 7 0	0 10 0	2 12 6	10 5 2	29 14 8	8 12 8		391 19 6½				
1783	13 5 10	11 6 6	6 15 2	30 0 6	73 19 10	8 18 8		3 3 0	15 9 11	27 11 7	7 4 9½		354 10 6				
1784	14 13 0	5 18 0	5 11 2	20 9 8	82 8 9½	6 14 7		5 6 10	1 2 3	13 3 8	2 8 3		315 3 2½				
1785	8 8 9	1 19 0		7 9 6	51 18 1	0 10 0			11 12 4½	12 2 4½	3 14 10		226 18 3				
1786	11 7 0			6 13 2	43 6 4½	0 10 0		2 12 6	31 7 1½	34 9 7½	0 8 9		223 14 5				
1787	11 18 0	3 17 0	4 8 8	12 2 11	49 3 9	0 5 0		2 12 6	30 8 7½	33 6 1½	0 9 9		320 1 9½				
1788	18 14 0		2 9 9	7 0 2	57 4 3	4 16 0		2 12 6	41 18 8½	49 7 2½	5 4 4		312 13 1½				
1789	11 9 0		1 19 0	5 14 9	38 8 11	1 3 6		2 12 6	16 4 11	20 0 11	4 10 11		229 11 8				
1790	13 11 0	1 19 0		6 12 3	31 7 5	0 10 6			34 17 10½	35 8 4½	1 13 8		261 18 3½				
Total	162 0 11	78 7 1	36 12 4	160 14 1½	727 12 7	91 0 9	3 12 7	27 9 4	237 8 7½	359 11 3½	62 7 4		3,676 19 4				

Source: S.R.O. DD/MGG 3, 5R. "Account book of weekly wages and daily receipts, 1779-1790".

Table 7(3): Analysis of the Accounts of the Farrington Pit, 1779-1790

I				II			III			IV			V			VI			VII			VIII			IX		
Labour Costs (Cols 1-5)				Cost of Materials (Cols 6-15)			Adminis- trative Costs (Cols 16-19)			Miscellaneous Costs (Col 20)			Annual Expenditure			Annual Revenue from Coal Sales			Annual Accounting Debt (Expend- iture-Revenue)			Cumulative Accounting Debt			Cumulative Expenditure		
£	s	d		£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d
1779	153	18	8	66	13	6	52	12	11½	1	10	11	274	16	0½	111	17	1½	162	18	11½	162	18	11½	274	16	0½
1780	255	17	5½	67	7	5	37	15	9	16	7	11	377	8	6½	158	3	4½	219	5	2	382	4	1½	652	4	7½
1781	264	14	1½	99	10	3	13	18	11½	10	0	6½	388	3	10½	74	4	1	313	19	9½	696	3	10½	1,040	8	5½
1782	287	8	2½	66	4	0	29	14	8	8	12	8	391	19	6½	98	5	2½	293	14	4	988	18	2½	1,432	8	0½
1783	245	14	3½	73	19	10	27	11	7	7	4	9½	354	10	6	135	5	6	219	5	0	1,209	3	2½	1,786	18	6½
1784	217	2	6	82	8	9½	13	3	8	2	8	3	315	3	2½	11	14	1½	303	9	1	1,512	12	10½	2,102	1	8½
1785	159	2	11½	51	18	1	12	2	4½	3	14	10	226	18	3	92	19	1½	133	19	1½	1,646	12	0½	2,328	19	11½
1786	145	9	8	43	6	4½	34	9	7½	0	8	9	223	14	5	250	17	5	+27	3	0	1,619	9	0½	2,552	14	4½
1787	237	2	2	49	3	9	33	6	1½	0	9	9	320	1	9½	243	12	1	76	9	8½	1,695	18	9	2,872	16	2½
1788	200	17	4	57	4	3	49	7	2½	5	4	4	312	13	1½	336	0	4	+23	7	2½	1,672	11	6½	3,185	9	4½
1789	166	10	11	38	8	11	20	0	11	4	10	11	229	11	8	149	8	0	80	3	8	1,752	15	2½	3,415	1	0½
1790	193	8	10	31	7	5	35	8	4½	1	13	8	261	18	3½	264	1	2	+ 2	2	10½	1,750	12	4½	3,676	19	4

Source: As in Table 7(2)

NOTE: This table is based on Table 7(2) and shows the distribution of the costs involved in this coal mining venture (Cols I to IV); the annual (Col V) and cumulative (Col IX) costs borne by the partners; the annual revenue from the sale of coal (Col VI); and the annual (Col VII) and cumulative (Col VIII) accounting debt.

Table 7(4)

Fixed Capital Formation Costs at the Farrington Pit, 1779-1790

Nature of Costs	Costs of Asset Creation plus Production					Fixed Capital Formation Costs				
	Table 7(2) Columns	£	s	d	%	Table 7(2) Columns	£	s	d	%
Labour	1 - 5	2,527	7	1½	68.7	2 - 5	1,119	9	5	56.0
Materials	6 - 15	727	12	7	19.8	6 - 15	727	12	7	36.4
Administration	16 - 19	359	12	3½	9.8	16	91	0	9	4.5
Miscellaneous	20	62	7	4	1.7	20	62	7	4	3.1
Total		3,676	19	4	100.0		2,000	10	1	100.0

Source: See Table 7(2) for source and evidence.

NOTE: This table attempts to distinguish between the general costs of sinking and working a mine, and those of fixed capital formation alone. It shows the distribution of expenditure in each case.

The sum of £2,000 for fixed capital investment at the Farrington Pit is given some credibility by the estimations already referred to for the establishment of simple mines with shafts and levels. But this was not a finite sum, and as Flinn has pointed out 'an unending flow of capital' would be needed to meet depreciation costs for example of machinery and horses, and to create new workings through 'running' investment⁴⁰.

The labour intensive nature of mining is shown in Table 7(4). Labour costs formed 56.0 per cent of the operation to sink the pit (68.7 per cent of general mining costs). Materials at 36.4

per cent and miscellaneous costs at 3.1 per cent were both more important in sinking than in the general case (19.8 and 1.7 per cent respectively). About a dozen miners were named regularly in the accounts. Bargains were struck with those otherwise on day work with no hint of an auction, though the scale observed is not self-evident. For example, in the light of other costs, the 7s.0d per yard agreed in December 1781 seems a low reward for 'driving a Branch through a Fault', whilst 14s.4d per yard in May 1780 for 'driving carting and filling 18 yards of Dipple' seems a lot for a small connecting branch. In April 1785 a bargain was 'let to Jas Payne & Co to sink a pit in Ruett to the Three Coal Vein for the Sum of Thirty one Pounds Ten Shillings', indicating the sinking of a second shaft in the field towards which earlier workings had been driven. A depth of 24 fathoms is later noted. The extension of the mine was combined with the winning of coal where possible, as column VI of Table 7(3) shows. When the accounts ended in October 1790, nine or ten men were then employed regularly on day work and a calculation based on the freeshare paid and the price of coal per bushel in the accounts, suggests that production then averaged between 120 and 150 tons per month.

Space does not permit the full account of the sinking of the pit which the evidence provides, but viewed overall the details build up into a picture of a mine worked by the longwall method which was better suited to the thin, faulted, Somerset seams than the pillar and stall technique in general use in the

northern coalfields. With the former nearly all the coal was removed from the working face, but the use of materials was correspondingly heavier. At Farrington these, with the miscellaneous items, made up nearly 39.5 per cent of capital costs at the pit, the expenditure on timber being particularly great. Purchased from surrounding estates, this was fashioned on site by the sawyer who made pit props or 'lugs' for roof support; lined shafts and passages with elm board; and made ventilation pipes or 'shides' from planks probably of oak. Rods and reeds were used to make baskets for the 'puts' which carried coal underground, and the 'wreath carts' in which it was hauled to the surface. The accounts carry no reference to winding equipment but the purchase of a drum, a blind horse, rope, and tarred yarn would have provided such a system⁴¹.

Gunpowder was purchased more regularly in early years than later, suggesting a greater use in sinking the pit than mining the coal. Payments for carriage were recorded, on nine barrels in 1781 for example, each customarily holding 100lbs. The mill at nearby Littleton was the likely supplier, and the powder was probably stored at the 'Round House' mentioned in the accounts. Gough refers to similarly named buildings on Mendip, where security would also have been a priority following the use of gunpowder in lead mining there from the 1680s⁴². Candles were supplied by the Lansdown family of chandlers and coal proprietors, and workmen's tools were also provided locally. In April and November 1782, shovels and mattocks came from

Fussells of Mells, iron masters and edge tool makers⁴³. The supplier presenting the greatest problem is Decimus Durnell, who received 22.0 per cent of the sums spent on materials over the years, for an unspecified commodity. However an account book kept by Jacob Mogg for other collieries in which he had an interest refers to dealings in cast iron with Decimus Durnell, and the supposition that he supplied the same goods to Farrington has been acted on in Table 9(3). These may have been engine or replacement parts, but the absence of any record for the purchase of a cylinder for which they might be needed argues against this, as do the terms of the renewal of their lease in 1799 by which the partners had to agree to erect 'a proper...fire or steam engine for draining the said mines'⁴⁴.

The introduction of steam pumping engines into the coalfield from the 1730s gives another example of Bristol's influence in the region, for as his account books reveal, the merchant and banker Thomas Goldney of that city was an agent for the Coalbrookdale Company, and instrumental in the delivery of engines and parts to several mines. Parts were delivered to Paulton in 1736 and 1745, Welton in 1762, and Clutton in 1763. Old Grove and New Tynning Pits may have had engines from 1766 and 1791 respectively, and the Middle Pit in Radstock had a Hornblower engine from the early 1780s⁴⁵. If by 1799 the Farrington partners were still not draining by steam power, this may have been because the methods mentioned in the accounts (drainage levels, and pumping by 'Pot Wheels' or waterwheels with 'cowles'

or buckets), were adequate for the depths then reached. The initial cost of a level was high, but unlike Newcomen engines maintenance was then minimal, and wider areas and other mines could be served. For example in 1791-2 a level over $1\frac{1}{2}$ miles long was built from the mines at Timsbury to Radford Bridge on the Cam Brook at a cost of £1,200, but other proprietors paid £350 the next year to link up with the system⁴⁶. The lack of references to steam power in the Farrington accounts may thus not imply the pit was unrepresentative of mines in the region, but that at certain stages of construction mechanical drainage was not necessarily the first choice.

The coalfield transactions underlying this work, involving regular contributions from partners and frequent payments for materials and labour (including as production got underway the need to finance such items of circulating capital as animal fodder and pithead stocks), must all have required a considerable handling of funds. Yet no reference has been found to links with a banking system, however rudimentary. Evidence may lie elsewhere, but the local nature of most of the transactions suggests a plausible explanation, for partners, suppliers of materials, and buyers of coal, may have maintained accounts with each other without recourse to financial institutions. The spread of investment costs which is so evident in the Farrington accounts would have helped this process, for the expenditure was built up slowly over the years. The buying of engines and parts would have added a new dimension to this

otherwise close-knit network, for the Goldneys were active in banking in Bristol from the 1750s and Bath from the 1770s. But the Farrington accounts show no such links, and the maintenance of acceptable procedures and of probity amongst partners would instead have been secured by the annual scrutiny of accounts, recorded in Table 7(2) as the 'audit fee'. The auditors were named, but have not been found in any registers drawn up for the region including that for the attorneys, although these professionals were very active in drawing up coal leases and mining partnership agreements.

In some cases the attorney's professional interest gave way to personal involvement, as with Robert Blinman Dowling of Chew Magna whose career has been pieced together from the many but now scattered deeds relating to the titles, mortgages, and mining rights of the Bishop Sutton pit eight miles south of Bristol. Much of this land had been acquired on marriage by the Kemeys Tynte family, but over the years ownership had largely devolved upon small gentry and yeomen. This fragmentation of an estate, together with the need for farmers to raise funds by mortgaging land and selling or leasing mining rights, created the opportunity for an enterprising attorney to insinuate himself into the system. Coal had been mined in this area from the early eighteenth century, on a small scale until a substantial partnership was set up in 1805 which was probably responsible for sinking the Old Pit at Bishop Sutton⁴⁷. As the Law Lists show, Dowling began work in nearby Chew Magna in

1797, and evidence survives of the traditional legal work he undertook on behalf of clients. But in the following years he came increasingly to act on his own behalf, especially in the matter of acquiring mining leases. Land purchased by him in 1807, 1811, and 1812 for example was subject to a range of freehold, leasehold (determinable by three lives), and mortgage interests, but after unravelling these complications he was able to sell surface lands in 1811 and 1813, reserving the mining rights for his own use⁴⁸.

This phase of activity ended in 1824 with Dowling's purchase of the Old Pit at Bishop Sutton⁴⁹. Though not strictly capital formation, the complicated transfer of assets of which this was the culmination may be regarded as contributing to this process for it enabled Dowling to consolidate an otherwise dispersed collection of buildings, shafts, and underground mineral rights into a more viable, productive, and profitable enterprise, with a resulting increase in its capital value. Indeed, the earlier acquisition over the years of coal rights vital to the working of the Old Pit probably meant that the £800 paid for it in 1824 bore little resemblance to its capital value when all the assets were consolidated. The extent to which Dowling's professional position helped in these manoeuvres is difficult to judge, but the fact that he was privy to his clients' financial problems must have influenced his timing. For example as mortgagees pressed upon the Webb family, yeomen of Chew Magna, he offered relief by purchasing land from them in 1824

despite being himself a trustee in whom a mortgage term was vested⁵⁰. Dowling's legal self-serving continued as he consolidated his mining interests and raised funds by mortgaging both surface and mineral rights so that by 1845 for example, more than £17,000 had been secured from at least 12 mortgagees in north Somerset and Bristol. On his death in 1853 the colliery and mining rights were conveyed to a partnership including the attorneys John and William Rees Mogg, who represented the continuing interest of both the legal profession and the Mogg family in mining in north Somerset⁵¹.

Dowling's mode of operation in Bishop Sutton was made possible by the fragmentation of landholding there. But this was not a peculiar case as is shown by developments at Nailsea west of Bristol, where much of the land was also held by small freeholders. Here a mining partnership made up of a gentleman, surgeon, and coalminer was joined in 1788 by John Robert Lucas, a Bristol glassmaker already noted who was then establishing works in Nailsea. He acted in a similar manner to Dowling though on a smaller scale, buying land and leasing its coaling rights to the partners in a process which came to a peak in 1823-4. As suppliers to the nearby glassworks the success of this partnership was assured, but others were not so fortunate in this area of poor transport. There was therefore strong support in 1811 for a Bristol to Taunton Canal, but as this was not built transport problems continued to affect the growth of coal mining here⁵².

iii Conclusions

This study of the process of capital investment in mining in north Somerset has revealed the importance of a network of interests in mineral rights, some of very ancient origin, and all capable of surviving the changes wrought by enclosures. Minerals were exploited under lease and usually by partnerships composed largely of local men, which gave to the development of this industry many of the characteristics noted in relation to agricultural investment. Indeed, the same people were often involved, as landowners, entrepreneurs, and professionals. The composition of the partnerships ensured that mining investment capital was drawn from a similar range of sources within north Somerset to that raised by land sales, and once more some Bristolians found this a useful outlet for their funds, albeit a far more risky one. There was the same remarkable degree of personal involvement by partners as they undertook roles later assumed by professionals. However they relied as heavily on attorneys as did those overseeing changes in landholding, and for the same reasons, since whether the issue was enclosure or mining, it was important that rights and responsibilities should be set out in indisputable legal terms.

The limited amount of information available makes it difficult to draw conclusions about the process of investment and the returns to capital placed at risk. However it may first be said that in the absence of local magnates the cost of

exploiting mineral reserves involving for example the investment of some £2,000 in fixed capital formation at the Farrington Pit during its first decade, could be better met by a partnership than by a single investor. Furthermore this support was most easily forthcoming where a mining venture was part of a larger network of activity. Losses could then be covered from profits generated by diverse and interlocking mining partnerships, as well as from other sources such as estate rents and professional fees. The skill of the entrepreneur was shown less by a commitment to any one scheme than by the ability to deploy financial resources within this network, so that capital was employed profitably overall despite the time taken for any one venture to mature. The mining of Mendip lead and calamine may have failed partly because the partners, many of them free miners and yeomen, did not have access to profits from other ventures to sustain them whilst investing in improved drainage.

Secondly, it seems likely that not just individual pits but coalmining itself was made viable in north Somerset by the general context of its operations. Transport facilities were of particular importance, and in their development the coalmasters played an active role. The perception that private profit could depend to a large extent upon the provision of public services may be seen most notably in the case of Jacob Mogg, but he was not alone in allocating to the building and management of the turnpike roads a good share of what was for a busy entrepreneur

a most valued scarce resource, his own time and energy. The names of over 20 other coalmasters appear amongst the trustees of the Bath Roads alone, helping to determine policy by deciding where roads should be built, and then supervising their construction and continuing repair. At the end of the century the transport network was further improved by the construction of the Somerset Coal Canal. This was authorized in 1794 to link up with the Kennet and Avon Canal, and ten coalmasters sat on the first committee. Like the turnpike roads had achieved earlier, the canals allowed an extension of the market in the early decades of the nineteenth century.

The evident willingness of partners to invest in coal mining places the occasionally gloomy views expressed about profits in some perspective. In the mid-1790s Billingsley wrote of the main coalfield that profits were 'in the aggregate, by no means equal to the extent and risque of the adventure', but his view that they were 'to a few works considerable; to the majority very moderate', can be taken to support the suggestion already made, that investment in the newer or less viable pits could be sustained by funds derived from interlocking partnerships⁵³. An example of this diversity of interests is provided in Table 7(5), based on Jacob Mogg's account of his management of the estate of his father-in-law George Hodges, landowner and coal master of High Littleton, after his death in 1761⁵⁴. The account book shows that after legacies, annuities, and other commitments had been met, Jacob Mogg retained in his hands by

1774 the sum of nearly £4,000. As the more substantial part of the income came from the landholding rather than the entrepreneurial interest, this would seem to question the wisdom of the latter. However some perspective is provided by the fact that in the years between 1762 and 1774 for which this evidence is available, mining revenue from freeshare and profit (described as 'cant' or gain and taken to be related to capital invested rather than output), approached £5,400, and averaged rather more than £400 per annum. And a closer study of the profit from Welton pit shows that between 1767 and 1774 Hodges' account received an average annual 'cant' of £58, and as his share was 1/7 the overall profits must have averaged £406 in this period⁵⁵. There is no evidence of the amount of capital invested in the mine, but sinking began in 1757, and if the Farrington procedures were followed then a sum of at least £2,000 might have been called up in the first decade, perhaps reaching £4,000 by 1774. Within these limits the returns to the partners may have ranged from 2.0 to 25.0 per cent, perhaps averaging 13.0 to 15.0 per cent, which would accord with Jacob Mogg's view expressed in 1796 that the Welton concern 'had been, and now is a profitable concern'⁵⁶. As custodian of these profits and the freeshare seen in Table 7(5), plus those accruing to him in his own right as a proprietor at Welton, together with those available to him as his brother John's executor, and the returns from his own successful schemes such as the Mearns pit at High Littleton, Jacob Mogg would have been well able to carry his share of the early losses at Farrington.

Table 7(5): Coal Mining Revenue Received by the Estate of George Hodges of High Littleton esquire, 1761-1774

Year	Welton Cant or Gain	Heighgrove Freeshare	Mearns Freeshare	Timsbury Freeshare	Amesbury Freeshare	Total Revenue from Coal Mining
	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d
1761	9 14 8½	54 19 5¼				64 14 2
1762	← 597 14 5¼ →					597 14 5¼
1763	← 691 9 6 →					691 9 6
1764	← 288 10 3¼ →					288 10 3¼
1765	← 229 15 9½ →			83 11 3		313 7 0½
1766	← 240 1 4 →			298 3 3		538 4 7
1767	47 6 0	← 50 7 2 →		296 5 0		393 18 2
1768	54 4 8	31 9 7	4 4 0	187 5 0		277 3 7
1769	59 7 11½	90 8 7½	78 9 1½	114 9 6		342 15 2½
1770	61 7 5¼	6 1 3¼	111 8 4½	67 1 3		245 18 4
1771	133 0 3¼	0 5 1½	237 3 0¼	9 8 9		379 17 3
1772	18 9 4½	59 8 3	106 12 8¼	76 5 6		260 15 10¼
1773	79 18 4	153 17 5	87 13 7½	32 1 3	92 16 3	446 6 10½
1774	12 5 11	154 14 6¼	224 7 4¼	127 10 0		518 17 9½

Source: S.R.O. DD/MGG Box 3. "Jacob Mogg's Act with the Estate of Mr Hodges" 1761-1776.

- NOTES: 1 The term "cant" (which may be a corruption of "count", meaning the settlement by a yearly transaction between landlord and tenant, Wright Dialect Dictionary) was from February 1769 replaced by the term "gain". Both are here taken to mean profit.
- 2 Payments were made on a one, two, or three monthly basis.
- 3 The table covers calendar years except for 1761, where evidence is available for the last three months only.

The only other evidence on the subject shows that the returns to General Popham on his share of 1/3rd in the Heighgrove works between 1806 and 1819 averaged £20 per annum, giving a possible profit of 2.0 per cent. Between 1829 and 1842 the Camerton Old and New Pits were more successful, the average profit of £800 per annum producing a possible rate of return between 5.0 and 10.0 per cent⁵⁷. Uncertainty hangs over these rates as at Welton, but they serve to show that in the early decades of the nineteenth century this form of investment was subject to the fluctuating rates of return which made a supportive network all the more important. This included not only the partnerships already referred to but the local suppliers of essentials such as gunpowder and candles, and the coal merchants in centres like Bath. It may have been the frequent but small-scale exchanges in local markets which allowed funds to be handled by those involved and not by banks. After all the same or similar gentry were also handling enclosure and turnpike funds. With lead and calamine in contrast the market lay in Bristol, and this may have led to links with banks not so far observed in coal mining. In other ways however their position was very similar to that with coal, as capital and mining needs were met from largely local sources. Partnerships accommodated non-workers as well as free miners, and there was an overlap of personnel including influential men like John Billingsley and Robert Wright. But these developments may have been rendered ineffective by the archaic structure of the industry which was fundamentally inimical to the growth of the entrepreneurial

spirit that enabled the coalmasters to support their own mines, and the industry, by a diversification of interests.

It must be admitted that the activities of the attorney R.B. Dowling and the glassmaker J.R.Lucas sit oddly with these conclusions for they were concerned with the acquisition of mining rights in areas of fragmented ownership. But these legal operations have a general as well as a particular interest, for although the evidence is not always so ample, most mining depended to a large degree on the purchase or lease of access to mineral veins, drainage channels and air vents. But it is unlikely surviving documents will cover all transactions, which may be further complicated by the sale or lease of surface rights, and the value of the whole may in any case be greater than that of the parts. It is these problems which make attempts to estimate accumulating capital value on the basis of assets acquired as well as those created, so risky. Lastly, it is difficult to distinguish between the costs of fixed and circulating capital, and those involved in working for lead, calamine and coal, but all were met by a regular, usually monthly, settling up amongst the partners⁵⁸. During construction, or unproductive times, they would have to draw on other sources of funds available to them.

- 1 Pollard, 'Coal Mining, 1750-1850' in Feinstein & Pollard eds., Studies in Capital Formation, pp. 35-72.
- 2 Roger Burt, British Lead Mining Industry (Redruth, 1984), p. 22.
- 3 J.W. Gough, Mines of Mendip (Oxford, 1930, revised edn. Newton Abbott, 1976), pp. 48-68, 112-15, 152-7, 168-9, 216.
- 4 Ibid., pp. 69-111; Burt, Lead Mining, pp. 26-31.
- 5 SRO, DD/WG Box 15, 'Mining Memorandum Book, 1773-1810'. In 1782 for example mining rights were granted for 7 years on land belonging to Robert Church.
- 6 Gough, Mines of Mendip, p. 2
- 7 Ibid., pp. 206-16, 223-7; Billingsley, Agriculture of Somerset, pp. 21-2, writes of the parishes of Rowberrow, Shipham, and Winscombe, that 'there are valuable mines of lapis calaminaris. This mineral is sometimes found within a yard of the surface, and seldom worked deeper than thirty fathoms. Between four and five hundred miners are constantly employed in this business, and the average price is about five pounds per ton'.
- 8 The Earl Waldegrave, 'James McMurtrie of Radstock, 1839-1914', Proc. Som. Arch. Nat. Hist. Soc., 114 (1970), pp. 27-36; Gough, Mines of Mendip, p. 95, n. 1. Surviving documents were studied and annotated by McMurtrie, agent to the Waldegraves from 1862 to 1904, in his successful quest for evidence to show that the mineral rights of East Harptree extended also to West Harptree.
- 9 SRO, DD/WG Box 14, 'Mr. Hare's Valuation of East Harptrey in Somerset and Renishaw in Derbyshire belonging to Thomas Scrope Esquire 9 September 1793'. McMurtrie noted that the Lord's profits from mining in this Liberty may then have been £400 per year. Yellow ochre was mined on Mendip from the mid-eighteenth century, Gough, Mines of Mendip, pp. 239-51.
- 10 SRO, DD/WG Box, 15, 'Chewton Mineral Book'. '104. A new Order Concerning Calamine and Oker, agreed upon by the Mineral Grand Jury 25 November 1773'.
- 11 SRO, DD/WG Box 15, Robert Wright's accounts for 1767-68, 1770-71, 1775-76.
- 12 SRO, DD/WG Box 15, 'Robert Wright's Account with the Trustees'.
- 13 SRO, DD/WG Box 15, 'Mining Memorandum Book, 1773-1810', Chewton Liberty; Q/RDe 23, Chewton Mendip enclosure award, 1797-1800.
- 14 SRO, DD/WG Box 15, 'Mining Memorandum Book'. For example, 5 Nov. 1787, 'Memorandum of parts or shares in the ore and

Callamnie works at Green Ore flat....Belonging to John York and Richard Millward', where shares ranged from 1/32 to 3/4.

15 Ibid., 12 October 1785; SRO, DD/WG Box 15, Bundle of Mineral Court Papers, presentments and findings of Jury, October 1783.

16 SRO, DD/WG Box 15, 'Mining Memorandum Book'. In November 1808 Billingsley and three partners were involved in a court case.

17 Billingsley, Agriculture of Somerset, pp.20-1, advocated a five mile level under the Mendips for drainage and exploration at a cost of £100,000, to be subscribed by shares of £100 each.

18 Gough, Mines of Mendip, pp.175-6, 247; SRO, DD/WG Box 14, East Harptree Minery, Accounts in Loading Books.

19 Gough, Mines of Mendip, pp.63-4, 134; Burt, Lead Mining, pp.248-64, and his 'Lead Production in England and Wales, 1700-1770', Econ.Hist.Rev., 2nd ser. XXII, 2(1969), pp.249-68; J Hatcher & T.C. Barker, A History of British Pewter (1974), pp.228-9.

20 SRO, DD/WG Box 14, East Harptree Minery, Account Books.

21 For the geology of the coalfield see John Anstie, The Coalfields of Gloucestershire and Somersetshire (1873).

22 V.C.H.Somerset, II, p.381; BAO, 12157, Mining leases in the Manor of Clapton, 1707-66; Thomas, 'Agriculture and Industry in Nailsea' pp.15-18, 45-75; SRO, DD/GL, Bundle 126, Brislington deeds; G.P.Davis, 'Social and Economic Change in a Somerset Village, Newton St.Loe 1801-1871' (unpub.M.Sc.thesis, Univ.of Bath, 1975), pp.254-82, and 'Coal Mining at Newton St.Loe', BIAS Jnl, vol.10 (1977), pp.27-33.

23 For a general account of the main part of the coalfield see C.G.Down & A.J.Warrington, History of the Somerset Coalfield (Newton Abbot, n.d.); SRO DD/WG Box 5, 'Small bundle about the discovery and initial mining of coal at Radstock'.

24 J.F.Davis, 'The Forest of Dean and Bristol and Somerset Coalfields' (unpub.Ph.D.thesis, Univ.of London, 1959).

25 Billingsley, Agriculture of Somerset, pp.26-30.

26 J.U.Nef, The Rise of the British Coal Industry (1932, 2nd imp.1966), I, pp.19-20; M.W.Flinn, The History of the British Coal Industry (Oxford, 1984), II, p.27.

27 Sydney Pollard, 'A New Estimate of British Coal Production, 1750-1850', Econ.Hist.Rev., 2nd ser. XXXIII, 2(1980), pp.216, Tab.3, and his 'Coal Mining', pp.35-8, Tab.2.1, 45, in Pollard & Feinstein eds., Studies in Capital Formation, pp.35-72.

28 Down & Warrington, Somerset Coalfield, pp.161-2; SRO, DD/RM Box 26, Deed of 1792 relating to coal works at Radstock, with details of earlier agreements; John A. Bulley, 'To Mendip for Coal: A Study of the Somersetshire Coalfield before 1830', Proc. Som. Arch. Nat. Hist. Soc., 2 parts, 97(1953), pp.47-50 & 98(1955) p.22.

29 Flinn, British Coal Industry, p.37; Bulley, 'To Mendip for Coal', II, p.25; SRO DD/MGG Box 2, Articles of Partnership between Samborne Palmer of Timsbury esq., Jacob Mogg of High Littleton esq., William Crang of Dunster surgeon, John Crang of Timsbury gent., Alexander Adams of Belluton esq, James Savage of Midsomer Norton esq.

30 SRO DD/SH Box 14, 'Colepitt Lease for 21 Years'; John Strachey, 'Coal-mines of Mendip', Phil. Trans. Roy. Soc., XXX, 360 (1719), p.968.

31 Bulley, 'To Mendip for Coal', I, pp.75-8, gives an account of this survey from notebooks no longer available. The mine was sunk in 1783, and the partners who brought Smith to north Somerset were: Jacob Mogg, John Crang, William Savage, Alexander Adams, Robert Langford, Henry Fisher, Christian Hill and William Short.

32 A.R. Griffin, British Coalmining Industry (Buxton, 1977), pp.33, 57; Flinn, British Coal Industry, pp.55-7; SRO, DD/MGG Box 3, 'Jacob Mogg's Acct with the Estate of Mr Hodges, 1761-1776'. Profit and freeshare for the Heighgrove, Welton, and Mearrings Collieries were paid successively by John, William, and Thomas Bush, and for Timsbury and Amesbury by John Crang, managing or working partners.

33 Information about partners comes from leases and here as elsewhere it has been checked against registers such as those compiled for attorneys and merchants. The rare evidence on the use of gunpowder comes from BA0, AC/AS/, Letters c.1746-63.

34 Bulley, 'To Mendip for Coal', II, pp.25-8; Down & Warrington Somerset Coalfield, p.92, 95-6.

35 SRO, DD/MGG Box 26, Deeds of the James family, including one referring to coal works in Radstock, 1792.

36 Bulley, 'To Mendip for Coal', II, p.26; A.R. Griffin, 'The Study of Mining History', Industrial Archaeology, II, 1(1974), pp.11-28; Flinn, Brit. Coal Industry, p.192; Pollard, 'Coal Mining', pp.36-45.

37 SRO, DD/MGG Box 3, 5R. An archivist's note reads 'Account Book of weekly wages (no indication of nature of work) and daily receipts, 1779-90'; Tithe map of parish of Farrington Gurney, 1840.

38 Down & Warrington, Somerset Coalfield, pp.132-6.

39 Information about Jacob Mogg as a coalmaster has come from leases and agreements amongst family papers, SRO, DD/MGG, espec-

ially Box 2. These reveal a network of at least 24 partners over the years, as well as numerous landowners with whom coal leases were negotiated, including the Duchy of Cornwall, esquires and gentlemen, a yeoman, and two spinsters. See also Bulley 'To Mendip for Coal' and Down & Warrington, Somerset Coalfield.

40 'Account Book', 1779-90, already noted. The concluding date is arbitrary and there is evidence from 'Mr Mogg's Acct Book 1779' that construction continued into the 1790s, SRO, DD/MGG Box 3; Flinn, British Coal Industry, pp. 194-5, on 'running' investment.

41 Bulley, 'To Mendip for Coal', II, pp. 74-5, records William Smith's description of the haulage arrangements at nearby Mearns colliery, where coal was 'landed by a machine turned by a horse which consists of a large upright axle..on the upper part of which is fixed a drumwheel..'the two ropes from which wound the full baskets up and the empty ones down, the horse driving 'the machine the contrary way' after each operation.

42 Gough, Mines of Mendip, p. 176, speculates that these may have been smelting houses, but from recent evidence of others found on the coalfield, powder storage is more likely.

43 Griffin, British Coalmining Industry, p. 100, believes iron tools only became cheap enough to replace wooden from the 1780s

44 SRO, DD/MGG Box 2, HRH The Prince of Wales to Jacob Mogg esq. and others, 12 February 1799. Lease of Coal Mines in the Manor of Farrington Gurney.

45 K.H. Rogers, The Newcomen Engine in the West of England (Bradford-on-Avon, 1976), pp. 41-7. Rogers also notes undated references to deliveries at two other collieries mentioned earlier, Nailsea Heath and Bedminster.

46 Bulley, 'To Mendip for Coal', I, pp. 70-4.

47 Down & Warrington, Somerset Coalfield, pp. 56-8; SRO, DD/FS Box 30 OB 1, 'Covenant for Coaling, 12 October 1805'.

48 Information on Dowling comes from: BAO, 21779, Lovell MSS, Deeds and papers of Bishop Sutton Colliery 1762-1917; SRO, DD/RM Box 9 and DD/FS Boxes 15, 16, 30.

49 SRO, DD/FS Box 30 OB 3, Henry Fisher of Bath esq., Lieut. in HM Royal Navy, to Mr Robert B Dowling of Chew Magna gent., 24 June 1824. Release of a messuage, lands, coal works, and premises at Bishop Sutton in the parish of Chew Magna, including two coalpits or shafts, 5½ acres of land, and a cottage, for £800.

50 SRO, DD/RM Box 9, Abstract of title to land in Bishop Sutton purchased in 1691 by Thomas Webb yeoman, concluding with details of Dowling's purchase in 1824.

51 BAO,21779, 28 deeds labelled 'Bishop Sutton Colliery 1844-55' and SRO, DD/FS Box 30 OB 4, OB 55. The Rees Moggs were from the late 1830s associated with coalmining on the estate of the Earl of Warwick at Clutton.

52 Thomas,'Agriculture & Industry in Nailsea',pp.45-50,63-4; Andy Bowman,'The Nailsea Coalfields 1500-1890',Jnl.Som.Mines Res.Group,I,3(1982),pp.46-63.

53 Billingsley,Agriculture of Somerset,p.27; Bulley,'To Mendip for Coal',II,pp.28-30.

54 SRO, DD/MGG Box 3, 'Jacob Mogg's Acct with the Estate of Mr. Hodges',1761-1776.

55 SRO, DD/MGG Box 2, Duchy of Cornwall lease of 1756 renewing one of 1732 at Welton. The partners were John Mogg, the trustees of George Hodges, Thomas Bush, Jacob Mogg, James Moore, William Savage, John Bush. Each partner was entitled to 1/7th share.

56 SRO, DD/MGG Box 3, 'Case for Mr.Romilly's Opinion',1796

57 Bulley,'To Mendip for Coal',II,pp.29-30.

58 The method of settling up on Mendip is shown in the 'East Harptree Minery, Grooving Accounts', SRO, DD/WG Box 14, where for example in December 1792 the monthly account for calamine works was met by three partners according to their share: Thomas Wright, brother of Robert, 3/8; George Pope, agent for Scrope the Lord Royal, 3/8; and William Hare,land surveyor,2/8. Two workmen were employed. The total called for was £4.8s.8d, of which candles came to 17s.1d. An example of the practice in coalmining comes from 'Mr Mogg's Account Book 1779', SRO, DD/MGG Box 3. Once more there was a monthly settling up. In December 1794 the 'Total out last month' minus receipts was £164 15 3¼, of which each partner had to pay 1/3rd. On 4 Dec. 1794 'Mr Gaby paid in part of the above the Sum of Fifty pounds', leaving £4.18s.5d outstanding.

Chapter 8 Capital Investment in Manufacturing.

By the mid-eighteenth century a wide range of manufacturing concerns were already established in north Somerset. Although to a large extent operated by water rather than steam power, the existence of this network meant that far from being a rural backwater the region provided a fertile context, stimulating a demand for coal (for processing as well as power) and other products, and producing the funds needed for investment. It is not possible to provide a comprehensive list of all locations, but at a conservative estimate there were over this period at least three hundred water-powered sites at which corn, grist, and logwood were ground, beer brewed, timber sawn, wool and silken textiles woven, leather tanned, paper milled, edge and other tools ground, brass and copper ware fabricated, glass fused, pottery baked, and gunpowder incorporated.

Within this range, three distinct types of enterprise can be distinguished. First there were concerns serving the needs of local consumers. At the domestic level these included millers, brewers and distillers, whilst producers' needs were met by those serving the agricultural and mining industries. Amongst the former were the breweries, clustered in Bath or dispersed in small settlements like Oakhill. Examples of the latter are provided by the edge tool works of the Fussell family, who operated at six sites centred on Mells between the granting of the first lease by the Horner family in 1744 and the take-over

by a Worcester company in 1880; and by William Evans' foundry at Paulton on the Somerset Coal Canal, which from 1810 to its decline in the 1890s was the only major firm in the coalfield supplying winding and pumping engines and other machinery. Both tool firm and foundry were based on local capital, and both suffered eventually from competition from outside the region¹.

Next, other industries such as woollen textiles and paper making also drew on local resources, but their products were sold widely outside the region, of which they were an important source of prosperity in the mid-eighteenth century although declining in importance thereafter. In the former the wool was initially provided by Mendip sheep, and spun and woven on a domestic basis until these processes came to be undertaken at centres such as Pensford, Chew Magna, Wells, and Mells before becoming concentrated on the eastern border, especially at Bath, Frome, and Shepton Mallet. The cloth was finished with Fullers Earth mined chiefly around Combe Hay south of Bath; teasles cultivated on Mendip's northwest slopes in such parishes as Wrington and Harptree; and dyes like woad, still a profitable crop in Keynsham at the end of the eighteenth century². But by then the region had fallen from its pre-eminence of the 1720s when Somerset was described as 'the most intent' of any county on woollen manufacture, and Defoe had noted 'The increasing and flourishing circumstances of this trade....the increase of buildings and inhabitants....and the wealth of the clothiers' in towns such as Frome³. Like fulling,

paper making depended on pure water from the Mendip limestone. The early seventeenth century mill at Wookey Hole was followed by others on the Axe and the Cheddar Yeo south of the Mendips; at Banwell, Compton Martin, Chew Magna, and Pensford to its north; and at Batheaston, Bathford, and Monkton Combe in the northeast⁴. Both industries declined from the end of the eighteenth century relative to developments in areas less bound by manufacturing traditions, but both remained successful producers of specialist goods, for example bank note paper and livery and riding cloth.

Lastly there were industries which although located in north Somerset to take advantage of the readily available water power, timber, charcoal, and coal, were essentially an extension of Bristol's commercial interests, part of the shipping and credit network through which raw materials were imported, finished goods distributed, and capital requirements met. Examples are provided by the gunpowder, copper, brass, and glass industries, whose fortunes were closely linked to those of the port and its merchants. In general they were founded in the early decades of the eighteenth century when Bristol ships traded widely and profitably, and they flourished in the middle period when although Bristol was declining in importance relative to Liverpool, the informal network of trade and credit still existed to support the manufacturing ventures. Their decline after the turn of the century was perhaps not only the result of the growing industrial competitiveness of the north

and midlands, but also a reflection of the loss of vigour by the port and its merchants.

Detailed information from which conclusions may be drawn about the sources and investment of capital is available for a few cases in this third category, and these will be examined later. It is ^{likely}~~possible~~ that the documents which make this possible were written and have survived because the port-based manufacturers were better able to run their ventures in a 'Shipshape and Bristol fashion', than the rural industrialists. Certainly, little evidence on local concerns has survived, and no ledgers or balance sheets have been found. On the major supplier of agricultural tools for example, the only material available is from a government enquiry of 1803 which shows that at James Fussell's works in Mells there were nine water wheels with forge hammers and other machinery, 25 pairs of bellows, 24 anvils and 140 grindstones. In addition to these items of fixed capital there were stocks of raw materials which included two tons of steel, 28 tons of bar iron, 80 tons of old iron, 150 quarters of coal, and 25 tons of ash timber. Finished goods comprised 1,700 dozen scythes and 500 dozen reaphooks. This tantalizing glimpse of the structure of the firm was repeated though on a smaller scale at the works of John Fussell, where there were two water wheels with forge hammers and machinery, 12 pairs of bellows and 12 anvils; 30 tons of bar iron and 60 quarters of coal; 12 dozen spades and shovels, 12 dozen hooks and axes, and 60 dozen spade and shovel stems⁵.

Evidence on paper mills is also very limited, but that relating to the mortgaging of Dulcot Mill near Wells between 1741 and 1787 is of interest for it indicates the value of the mill at that time, and also reveals some of the financial links with Bristol⁶. A paper of 1756 declared that the mill complex, including 'a drying house lately built', was 'not equal to the sum' of £1,800 for which it provided security, although when a 'bridging' loan between long-term mortgages was arranged for two years from 1767, this was for £1,900 at a rate of interest of 4 per cent. It was supplied by three Bristolians of whom Thomas Blagdon remains an unknown gentleman, but Michael Miller sr. was a merchant trading in wines and spices from 1731 and in slaves from the 1750s (named as a Trader to Africa in 1755, and funding eight voyages there in the 1760s), and a partner in Miles Bank from 1752 until 1785. The third mortgagee, his son Michael, was from 1768 to 1779 a partner in the Woolley Powder Works to which his father loaned £1,000 between 1768 and 1772.

Even closer links were demonstrated by the major glassworks in north Somerset established at Nailsea in 1788, for the leading partner was J.R.Lucas, the successful Bristol merchant and manufacturer already noted, who owned a beer and cider warehouse and a third share in a glass bottle works in the city. His family links with north Somerset show yet another aspect of the ties between Bristol and the region for in 1781 he married Anna Adams of the family based at Stanton Wick some eight miles south of Bristol, long-associated with coalmining

and glassmaking. Lucas rented the glassworks there until the lease expired in 1815, but in the meantime this experience had encouraged him to seek a new site on which he could expand outside Bristol, and he chose Nailsea Heath. Here there was a good supply of cheap coal from a newly-opened colliery, stone for industrial building and domestic housing, lime and sand for processing, and clay for crucibles. Transport by road was difficult but business thrived, and bottles and window glass were sold widely around the Severn estuary, across the Atlantic, and to the Baltic and west Mediterranean countries. By dint of borrowing, and re-forming the partnership over the years, the capital was built up to £72,000 in the 1820s, when Nailsea became the fourth largest glassworks in the country⁷.

The opportunity for a fuller study of capital investment in manufacturing is provided by the following three cases. For reasons already suggested all are Bristol-financed enterprises.

i The Gunpowder Mills at Woolley

Gunpowder makers were active in Bristol from at least the 1630s, but the hazards of this operation caused them to look outside the city limits for sites which could offer seclusion and accessibility. The valleys of north Somerset met this need, as well as being able to provide water power and charcoal from the local woods. Links with Bristol were vital, for into the

port came the saltpetre and sulphur that were with charcoal the ingredients of gunpowder, and from it the finished product could be shipped both coast-wise and abroad. As well as supplying such practical facilities, the merchant community of Bristol provided a credit network for the trade and helped to meet the capital requirements of the undertakings. The Woolley works were built in the 1720s near the village of that name in the deep valley of the Lam Brook three miles north of Bath⁸. They were part of a group which flourished in the eighteenth century at Littleton, Chew Magna, and Moreton, with possibly other sites at Winford, Long Ashton, and Dead Mills near Woolley. It may seem unfortunate that the best documented firm in the region manufactured such a specialized commodity, but if its importance is unrecognized in this period, that is largely because this subject has been so neglected.

Evidence about the Woolley Mills is displayed in Table 8(1), which shows a remarkable continuity of information from the 1740s to the early years of the nineteenth century, based almost entirely on papers of the Strachey family of Sutton Court, encountered already in relation to coalmining. Their links with the Woolley works began with a marriage into the family of John Parkin, iron merchant of Bristol and original partner in the firm. When he died in 1733 control of part of his share fell to his son-in-law Hodges Strachey (a name which shows that the Stracheys like the Moggs were linked to the Hodges). The family association with gunpowder continued until

the death of Sir Henry Strachey in 1810. Leases and partnership papers were kept from the 1720s, and balance sheets and correspondence from the 1740s. Membership of Parliament and residence in London meant that the problems at Woolley and the news of lobbying at Westminster were communicated by letter⁹.

In Table 8(1), columns I and II show the fixed and circulating capital of the firm as valued in the balance sheets. The former comprises buildings and utensils, and the latter raw materials and finished goods. Their relationship is expressed in column III, where fixed capital is shown as a percentage of the combined assets. Pollard has suggested that only in the cotton industry was fixed capital the major component, and in seven examples from the metallurgical industries the proportions ranged from 8.8 to 33.2 per cent¹⁰. The proportions at Woolley were so much higher, from 32.0 to 86.2 per cent, as to raise the question of whether the buildings may have been over-valued or the stocks and stores under-valued. On the former proposition it is impossible to say conclusively whether the figures in column I represent a fair valuation, but their slow increase over the years gives some verisimilitude, and when for example a 'New Magazine' was added to the value of the buildings in 1751, accounts with a mason, carpenter, tyler, smith and 'plomer' confirm construction was then underway. A close study of the balance sheets has revealed the processes which took place at Woolley, and the special buildings and utensils that would thus be required there.

Table 8(1): Analysis of the Woolley Gunpowder Works, 1746-1807

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
	Fixed Year Capital	Circu- lating Capital (1)	Fixed Capital as per- centage of I+II	Trade Debtors	Credit Creditors	Balance of Trade Credit	Adminis- trative Balance	Circu- lating Capital (2)	Fixed Capital as per- centage of I+VIII	Loans to the Partners	Partners' Capital	Dividend	Rate of Return on Partners' Capital
	£	£	%	£	£	£	£	£	%	£	£	£	%
PART I													
1746	2,200	3,559	38.2	5,194	676	4,518	215	8,292	21.0		9,000	1,492	16.6
1747	2,200	2,846	43.6	5,336	892	4,444	479	7,769	22.1		9,000	969	10.8
1749	2,200	3,665	37.5	5,872	1,766	4,106	506	8,277	21.0		9,000	1,478	16.4
												Account for 2 yrs.	
1750	2,200	4,089	35.0	3,994	1,748	2,246	316	6,651	24.8		9,000	Account incomplete	
1751	2,700	4,240	38.9	4,166	520	3,646	566	8,452	24.2	1,500	9,000	652	7.2
1753	2,700	3,905	40.9	7,163	3,648	3,515	448	7,868	25.5	1,500	9,000	67	0.7
1754	2,700	4,540	37.3	9,185	6,050	3,135	590	8,265	24.6	1,500	9,000	465	5.2
1755	2,700	4,572	37.1	10,461	6,202	4,259	292	9,123	22.8	1,500	9,000	1,324	14.7
1756	2,700	5,743	32.0	11,566	8,233	3,333	175	9,251	22.6	1,500	9,000	1,450	16.1
1757	3,000	3,953	43.1	12,128	8,254	3,874	1,519	9,346	24.3	1,500	9,000	1,845	20.5
1758	3,000	2,543	54.1	14,169	7,266	6,903	343	9,789	23.4	1,500	9,000	2,290	25.4
1759	3,000	2,676	52.8	12,303	5,947	6,356	460	9,492	24.0	1,500	9,000	1,993	22.1
1760	3,000	1,712	63.7	12,307	5,938	6,369	939	9,020	24.9	1,500	9,000	1,520	16.9
1761	3,000	1,020	74.6	11,151	3,540	7,611	924	9,555	23.9	2,100	9,000	1,455	16.2
1763	3,000	1,746	63.2	10,119	3,306	6,813	210	8,769	25.5	2,100	9,000	669	7.4
1764	3,000	2,010	59.9	7,980	426	7,554	645	10,209	22.7	3,600	9,000	609	6.8
1767	3,000	1,965	60.4	9,568	590	8,978	- 56	10,887	21.6	3,500	9,000	1,388	15.4
1768	3,000	2,313	56.5	8,224	171	8,053	-416	9,950	23.2	3,500	9,000	450	5.0
1769	3,000	3,140	48.8	7,798	287	7,511	-221	10,430	22.3	3,500	9,000	929	10.3
1771	3,000	1,559	65.8	9,298	294	9,004	- 55	10,508	22.2	3,500	9,000	1,008	11.2
1772	3,100	2,235	58.1	8,513	226	8,287	506	11,028	21.9	3,500	9,000	1,628	18.1
1773	3,100	3,634	46.0	7,607	185	7,422	- 78	10,978	22.0	3,500	9,000	1,579	17.5
1774	3,100	2,118	59.4	9,318	318	9,000	-175	10,943	22.1	3,500	9,000	1,544	17.1
1778	3,100	4,508	40.7	5,440	111	5,329	-145	9,692	24.2	3,500	9,000	292	3.2
PART II													
1780	3,100	2,811	52.4	8,483	161	8,322	-493	10,640	22.6	3,500	9,000	1,236	13.7
1784	4,000	2,075	65.8	8,154	161	7,993	-435	9,633	29.3	3,500	9,900	234	2.4
1788	4,000	2,402	62.5	9,455	110	9,345	-655	11,092	26.5	3,500	9,900	1,691	17.1
1789	4,000	3,058	56.7	9,077	167	8,910	-465	11,503	25.8	3,500	9,900	2,102	21.2
1790	4,000	1,731	69.8	10,346	98	10,248	-806	11,173	26.4	3,500	9,900	1,791	18.1
1792	4,000	1,414	73.9	10,862	116	10,746	-422	11,738	25.4	3,500	9,900	2,338	23.6
1793	4,000	1,366	74.5	11,102	242	10,860	-846	11,380	26.0	3,500	9,900	1,980	20.0
1794											9,900	1,740	17.6
1795	4,000	3,409	54.0	9,052	200	8,852	-255	12,006	25.0		12,000	4,007	33.4
1796	4,000	638	86.2	8,480	91	8,389		9,027	30.7		12,000	1,541	12.8
1797	4,000	729	84.6	10,748	114	10,634		11,363	26.0		12,000	3,677	30.6
1798	4,000	6,779	37.1	3,284		3,284		10,063	28.4		12,000	3,541	29.5
1799											12,000	3,370	28.1
1800											12,000	2,411	20.1
1801	4,000	449	89.9	10,275	369	9,906		10,355	27.9		12,000	2,355	19.6
1802											12,000	997	8.3
1803											12,000	1,379	11.5
1804											21,000	2,945	14.0
1805											21,000	3,177	15.1
1806											18,000	3,645	20.2
1807											18,000	2,573	14.3

Sources and Notes on following page.

Table 8(1): Analysis of the Woolley Gunpowder Works, 1746-1807

Source: SRO, DD/SH Box 27.

With the exceptions listed below the sources are the annual balance sheets, usually drawn up on 30 June when work was likely to be at a standstill due to lack of water. Information was also derived from letters dated: June 1794, 29 March 1799, 29 January 1800, 5 December 1800, 28 January 1803, 27 September 1803, 18 August 1804, 30 July 1805, 23 July 1806, 30 July 1807.

Notes: The division in the table marks a change in accountancy practice. The balance sheets of Part I were written in an older style hand with liabilities on the left under the Dr. heading and assets on the right, Cr. side. From 1780, see Part II, the balance sheets were written in a more modern hand, with assets on the left under the Dr. head and liabilities on the right, Cr. side. The switch may have been made to conform to contemporary practice, see Hamilton's Introduction to Merchandise(1788),p.286 (quoted by Yamey, Edey & Thomson,Accounting in England and Scotland 1543-1800(1963),p.133) which says, 'The Dr.of the balance-sheet contains every kind of property belonging to you, and every debt owing to you; and the Cr. contains every debt owing by you: Therefore the difference of the sides exhibits your nett estate'.

The contents of the columns are discussed in the text.

Of the three ingredients of gunpowder¹¹, only the charcoal was bought locally. It was already charred, but had to be crushed in a mill. As the stocks held at the annual casting up could amount to 1,500 to 2,000 bushels, some form of storage would be required. Saltpetre came from the Baltic and India, and sulphur from the Mediterranean, especially Sicily and Italy, and both were refined at Woolley, for the annual inventories record the quantities of each in a rough and a refined state, showing that some had been already processed and some awaited treatment in special buildings and plant. In the early 1760s advice was received from the Board of Ordnance on how the refining techniques could be improved¹². The prepared ingredients were then ground and mixed under pressure, by edge runners weighing $2\frac{1}{2}$ to 3 tons, housed in incorporating mills. According to the Memorandum of 1747/9 there were then four such mills at Woolley each able to grind 25lbs in 2 hours. The resulting 'serpentine' powder was prone to separate into its distinctive ingredients when transported, but this disadvantage was overcome by the additional processes of corning, glazing, and pressing, that served to consolidate the grains. There is evidence that this sieving, polishing, and compacting took place at Woolley for the powder stored was listed as F, FF, or FFF, showing that not only discrete grains but pellets of a specified uniform size were produced there. Finally the powder was dried in a building of which it was said in the 1740s, 'The Stove dries from 70 to 80 Barrels at a time and that in 48 hours'. The powder was then stored in a magazine for security.

This account cannot demonstrate beyond doubt the accuracy of the figures for fixed capital in column I, but by showing the range of procedures undertaken at Woolley and the buildings and equipment required, it can be claimed that they may reasonably be assumed to be correct. In addition, costs may have been high because these buildings were different from the usual mills of the countryside for they had to combine flexibility with strength, stout structures with a flimsy roof or wall which would give way easily if there were an explosion. Further costs were incurred by the need to secure a good supply of water for processing and power, which led to the construction of a system of leats, conduits, and mill ponds, referred to in the leases and substantial enough to survive today. These efforts to increase and store water supplies in order to ensure continuity of production on a relatively small stream must have formed a part of the high fixed capital costs recorded in the balances.

The possibility of an undervaluation of raw materials and finished goods must next be considered. It might be thought that the assessment of the former would fluctuate with the uncertain arrival of supplies by sea, but such variations were lessened by the inclusion of stocks on board ship and in the warehouse in Bristol (rented from the Corporation), with those at Woolley. For example, the records show that in June 1759 casks of saltpetre to the value of £1,131 were stored at the warehouse in the Fryars, and in 1760 a comparable amount valued at £1,093 was listed as still on board the Henrietta Constantia

bound from Dantzic. In 1795 when no refined petre was recorded at Woolley, and only two hundred weight was being processed, they were clearly awaiting the arrival of the Partridge with 100 bags of saltpetre at £826, and the Chard with 200 bags at £1,948. In addition, accounts were held with merchants in Bristol and London handling cargoes of saltpetre and sulphur, which further mask the raw materials in transit that might otherwise have figured in the annual inventories. They form the main part of column V, as sums owed to the partners' creditors.

The inventories also listed stores of gunpowder held at the works, at the magazine in Bristol, and between 1751 and 1759 at Liverpool where sales were handled by Arthur and Benjamin Heywood. The last item disappeared from later statements but this outlet was not abandoned for the partners valued it so highly that when wartime prohibitions meant that supplies could not travel coastwise in the early 1760s they sent waggons overland at a cost of 10s to 12s per barrel, and a letter of 1800 about the lease of the Liverpool magazine shows the partners still maintained stores of gunpowder there. If these were not itemized in the inventories, how were they accounted for? Column IV of Table 8(1) holds the key. The debts owed to the partners shown there were until 1757 mostly recorded under the general heading 'By Debts outstanding'. This was then reduced, and a compensatory item appeared, 'By Baugh Ames & Co their Ball as p their Accot Currt to this day...£7944'. The Heywoods still had a balance representing the Liverpool stores, valued

in 1757 at £2,227, but in 1759 this too disappeared from the accounts and the debt owed by Baugh, Ames & Co. had risen to £11,674. It seems that these Bristol merchants (the former a partner at the Woolley Powder Works, the latter at Littleton), had taken responsibility for marketing the gunpowder and that the figures in column IV represent stores held in the magazines as well as small unsettled debts to the Woolley partners.

Further evidence of this undercounting of the circulating capital comes in 1799 when the partners were concerned with the assessment for the new income tax, to be based upon profits, with allowances for fire insurance, magazine rents, and outstanding debts¹³. To establish the first claim, the buildings and utensils were valued for the year 1798 at £4,000 and the stocks and stores at £6,779 (made up of raw materials at £1,220 and powder in Bristol and Liverpool at £5,559). Outstanding debts totalled £3,284. This suggests that over 60 per cent of what in other years appeared in the credit network was in fact part of the stocks and stores. This makes it likely that the 1798 figure of 37.1 per cent as the proportion of fixed to fixed and circulating capital provides a good estimation of this relationship over the years, especially as it indicates a return to the ratio in the period before 1757 when Baugh & Ames took charge of merchanting, and a substantial part of the capital was lost amongst the trade credit figures.

These difficulties suggest that for an historical analysis the narrow definition employed so far is unrealistic. If circulating capital were defined more broadly as a balance of all assets turned over in the course of business this would have the advantage of allowing for items in different categories from those ordained by modern practice, as well as some which might otherwise escape altogether. This broader definition may owe more to accountancy than to economic theory¹⁴, but by allowing for an assessment of all assets of single use available to the firm in a particular time, it may provide a picture of greater historical accuracy, though lesser economic purity. Column VIII shows this revised figure for circulating capital based on stocks and stores, the balance of trade credit, and the small and sometimes negative administrative balance which is nevertheless important because it included items like rent, which secured the right to waterpower, and insurance, which underwrote materials in transit. It is not unreasonable to suggest that on this broader definition, fixed capital represented about 25 per cent of the total assets of the firm, see column IX.

Despite this re-valuation the proportion is still high, perhaps due to the varied stages of manufacture requiring a range of buildings and utensils; or to the fluctuations in demand, due for example to bouts of privateering, which may have led to an over-provision of plant for use at busy times. Even more importantly these relative proportions may reflect the origins

of the firm, for having been founded by and remaining associated with Bristol merchants there may have been less difficulty in financing such works than would otherwise have been the case. This lack of financial stringency is shown in another aspect of the asset structure of the firm, for over this long period a positive balance of trade credit was maintained since the partners did not need to use this as a way of acquiring capital¹⁵ : instead, they were able to support a trading partnership in Bristol, thus helping to sustain the merchant activities from which they came rather than to stimulate new economic activity in north Somerset.

The four original partners in the Woolley works, founded 1722, were all well-established in the Bristol trading network, members and officers of the Society of Merchant Venturers, shipowners and traders in linen, iron, and sugar. Three were also engaged in the slave trade: Abraham Hooke financed 23 voyages from the beginning of the century, and John Parkin and Edmund Baugh became involved in the years before the setting up of the Woolley mills. The network extended beyond Bristol to include trade and government circles in London. The site at Woolley was leased from the London merchant William Parkin, brother of John and a partner himself in the 1730s, with whom a trade balance was maintained until 1747. The Stracheys were north Somerset landowners (with property in Bristol from the 1720s¹⁶), whose political contacts were of great importance to the partnership. As a young man the later Sir Henry was already

by 1762 lobbying for the partners and suffering 'tongue and foot fatigue' as a result. He had a Parliamentary seat for over 40 years from the 1770s, and served as Keeper of His Majesty's Stores, Ordnance and Ammunition of War in 1783¹⁷. The Dyer family network also provided links with London, an account held with James Dyer there continuing from 1764 until the last available balance sheet of 1801. The commodity dealt in was probably saltpetre, and although the balance shifted greatly the debt to the partners in for example 1788 was £2,500. Robert Dyer of Bristol became a partner in 1780, and introduced a new format for the accounts when he took charge of them that year. George Dyer was a London broker who became a partner in the 1790s. Lastly, William Wansey, a partner from 1753 to 1767, served not only Woolley but also other Africa traders in Bristol. He was admitted to the Merchant Venturers in 1749 'in consideration of having given a long attendance in London about the Africa trade and done all in his power for the service of the trade'¹⁸. He was himself a trader, involved in eight voyages between 1745 and 1763, and named in the 1755 List.

From the earliest extant agreement of 1733 the partners' capital totalled £9,000 until the new partnership of 1784, when it became £9,900, rising in 1795 to £12,000 until after the turn of the century as shown in column XI of Table 8(1). A consolidation with the Littleton works in 1803 then resulted in a joint capital of £21,000, reduced to £18,000 on the death of a Littleton partner in 1806. John Parkin's share passed to his

two daughters, through whom one part came to the Strachey family whilst the other was retained by a spinster known as Mrs Elizabeth Parkin until her death in the mid-1760s. It was then inherited by the Worgan family, of whom Matthew succeeded his father John as manager from 1747 until his death in the early 1790s, by which time he had made loans to the company totalling £3,500. In the early 1780s he held 20 joint stock shares in the Bristol Brass Wire Company by purchase and inheritance, valued then at £5,000. Edmund Baugh's share passed to his son Isaac who managed affairs in Bristol until his death in 1786 and who was included in the 1755 List of Africa traders. Abraham Hooke's executor Joseph Houlton held this share in his own right from 1740 to 1753. He came from a family of prosperous clothiers on the Wiltshire/Somerset border who had bought the manor of Farleigh Hungerford in the early 1700s. Of later partners, mention may be made of: the younger Michael Miller (encountered already in relation to Dulcot mill) who engaged in eight slaving voyages from 1760 until 1768 before joining the Woolley works that year; John Vaughan jr, a founding and managing partner of Miles Bank in 1752, who became a Woolley partner in the 1770s after he and his father had engaged in four slave voyages from 1759 to 1764; William Elton who became a partner in 1778, some half dozen of his family if not he himself having engaged in numerous slave voyages in the first half of the eighteenth century; and James Jones, a substantial shipowner who became a partner in the mid-1780s at a time when

he was said to have nine vessels on the coast of West Africa and at sea, capable of carrying 3,520 slaves¹⁹.

As the partners' capital rose towards the end of the century their number declined, this concentration in fewer hands being achieved by the Articles of Partnership of 1783 which stated that shares could not be disposed of by will but were to be taken by surviving partners on payment of compensation. The determination to increase their share of profits at every opportunity was eventually to Sir Henry's disadvantage, for he in turn fell victim to this aim despite appeals to moral principles, sentiment, and good business sense²⁰. On his death in 1810 his heir was excluded. Even the capital sum of £3,000 paid for the Strachey share was less than hoped for, as in 1799 Sir Henry had suggested hopefully that, 'considering the Profits of our Trade..ought not the sale of his share to his Partners to be in some Proportion to the average Profits as the fairer Estimate of its real Value'?²¹.

The 'Profits of our Trade' were the reason for this reluctance to allow the association with the powder works to be ended. The sums shared annually amongst the partners were based on the difference between assets (buildings and utensils, inventory of stock, and debts owing to them) and liabilities (debts to be paid, both trade and financial, and a sum equal to the partners' capital which might be called upon at dissolution or death). This arrangement is contrary to Pollard's experience

that 'all liabilities, except for the original partners' capital, were deducted'²². However the partners at Woolley did fail to allow for the cost of their capital, either by setting aside a 5.0 per cent rate of interest to be met by earnings before profits were declared, or by drawing up a balance sheet in which this figured as a distinctive element in the dividend. Instead it merged with profits to produce an annual return to the partners' capital which was great enough to stifle any concern about its composition. However the partners remained aware of this distinction, as is shown by calculations made by Henry Strachey in 1798 when he deducted a sum representing a 5.0 rate of interest from the dividend received each year over the past decade²³. A greater cause of worry was the conveyance of the dividend. In 1796 Henry Strachey was sent £513 in seven bills with the note, 'it is a matter of the greatest difficulty to secure any sort of London paper here'. In 1797 the problems grew worse, for the 'very considerable sales of Gunpowder at Liverpool' had been met by 'Bills at a long date' on which proprietors were offered interest until they became due. The return on capital was then 30.6 per cent. In 1795 it had been even higher at 33.4 per cent and discretion was urged for 'the dividend is so great that the utmost secrecy is necessary'. Strachey's account was credited with £1335.12.6d, since a letter was not trusted²⁴.

Why were the profits at Woolley so high that over the period covered by the balance sheets the average rate of return was

15.5 per cent? The advice of the Board of Ordnance in the 1760s to try 'different Compositions different times of grinding etc' by which means we may hit on the right method as others have done'²⁵, makes it unlikely that these were a return to an innovative technology. Nor were capital and entrepreneurship so scarce in that context as to have monopolistic elements reflected in high rates. The Woolley partners raised loans at 4.5 and 5.0 per cent, column X, with an ease which reveals the availability of funds in Bristol, the shortage of speculative opportunities there, and the confidence felt in the concern. For example from 1751 until he died in 1757, £1,500 was loaned by Onesiphorous Tyndall, at 4.5 per cent until 1755 and then 4.0 per cent. He was a West Indian merchant, drysalter, and major slaver, in which trade he was involved as both shipowner, and slave factor in partnership with Isaac Hobhouse and Richard Assheton. Thus well-provided, he became the senior founding partner in the Old Bank, set up in 1750 as the first in Bristol under a proper deed of partnership. The career of Michael Miller sr., wealthy merchant and partner in the rival Miles Bank founded in 1752, followed a similar path as already seen. He loaned the partners £1,500 at 5.0 per cent between 1768 and 1772. As to entrepreneurship, although the initial decision to allocate resources to this use at Woolley led to the stream of high profits, their maintenance came to depend less on this attribute than on the skills of the merchant and political lobbyist, neither of which was in short supply in Bristol and London.

Perhaps more significant in terms of profits was the special niche occupied by the north Somerset powder mills. Earlier sites dating from the mid-sixteenth century were chiefly in Kent and Surrey, producing powder largely for military and naval use. Later ones such as those in Westmorland and Furness were founded towards the end of the eighteenth century, and made powder chiefly for mining. For much of the intervening period therefore the mills of north Somerset played an important role in the geography and chronology of powdermaking, supplying it for mining, musketry and commerce in the immediate region, the western seaboard, the Africa trade and the American colonies. Its early use for blasting in this region, in lead mining from the mid-1680s and coal mining in the mid-1710s²⁶, must have been a consequence of and stimulus to the setting up of local mills, especially as its employment in this industry elsewhere came in general only slowly in the second half of the eighteenth century²⁷. The proximity of Bristol allowed the market to be extended to Wales and Cornwall, and as late as 1804 the managing partner set out for the latter with expectations 'of doing something with the miners which will be very beneficial to our concern'²⁸. Another distinction to be drawn was between 'Guinea powder', sold to the Africa merchants as a barter good and 'Merchant powder', sold abroad or carried as an armament. The former was inferior but may have been made in larger quantities, for in 1762 for example the partners held 638lbs of Merchant and 1,144lbs of Guinea powder²⁹, though there may have been other reasons for the discrepancy.

Lastly it must be asked whether the level of profits owed anything to specific events rather than general circumstances. Column XII shows that the most profitable periods co-incided with wars, but the relationship was not a simple one for despite their best efforts in the early 1760s for example, the partners failed to gain a government contract, and had they been more successful later this would probably have emerged in the documents. Indeed such failures worsened their position, for licences for coastal trade were in wartime limited to government suppliers³⁰. In addition war years were difficult ones for Bristol traders, and the port generally declined as markets closed and ships came under attack from warships and privateers³¹. The Woolley partners suffered particularly from restrictions on the Africa trade at those times, and from the loss of the American market between 1776 and 1783. These circumstances combine to make the high wartime profits all the more puzzling. An increasing demand for metal goods may have stimulated both the copper and coal mining industries, with a rise in the use of gunpowder, but privateering may offer a more likely answer. This has been called 'a favourite pursuit of speculative Bristolians' during the eighteenth century. In the 1740s there were 49 privateers with about 20 guns each, and in the later 1750s there were over 60 with up to 36 guns each. In 1746 for example the Southwell was fitted out by a partnership including Michael Miller sr, and the other Africa traders, Thomas Deane (partner in the Littleton powder works), James Laroche, and Cranfield Becher. In the Independence War however

the Americans seized the advantage by prying on Britain's west coast and although some 21 Bristol privateers retaliated the response was muted for these were such disastrous years for the city's trade and manufacture that there may have been few funds available for privateering³².

The circumstantial evidence thus supports the suggestion that the high profits were due less to monopolistic returns to capital and entrepreneurship, than to the favourable conditions of timing and location, which made the initial entrepreneurial decision a continually profitable one for the next eighty years. The partners exploited these favourable market conditions by ploughing back very little of their profit into the powder works, which therefore remained a rewarding but slow-growing concern. Between 1746 and 1801 when the partners' capital rose slowly from £9,000 to £12,000, the annual rate of increase of gross fixed capital may be estimated tentatively at 1.1 per cent. However this generally low rate obscures the pattern of investment which may have led to the following annual rate of growth of gross fixed capital: 1746-51, 4.2%; 1752-57, 2.1%; 1758-72, 0.2%; 1773-84, 2.3%; 1785-1801, 0%. There is no evidence on depreciation, which may in any case have been less important for mill buildings and heavy long-lasting machinery than for steam-powered factories. The sources of the capital invested were mixed, coming as much from outside loans as from partners increasing their shares or diverting their dividends. After 1785 even this modest investment ceased,

suggesting that a major internal reason for the decline of the company was the partners' failure to invest in productive assets which led not only to a lack of growth but also a failure to diversify. Unlike some powder makers such as the Du Pont company in Delaware, the Woolley partners failed to seize the opportunities available to develop the industry.

The north Somerset powder mills were also adversely affected by changes in the world economy. The Africa trade in slaves was in decline by the end of the eighteenth century³³, at the same time as the North American market had become vulnerable. Trade with the United States had revived after hostilities, but for items like gunpowder the setback continued as home-produced goods replaced those previously shipped across the Atlantic. The urgency of the situation may be judged from two documents. The first, the memorandum of 1747/9, stated that the Woolley works then produced 2,000 to 4,000 barrels of powder each year. The second, a paper of 1802 setting out the position at the Woolley and Littleton mills, stated that in the past eight years the former had produced 8,846 and the latter 8,942 barrels, the partners' capital employed at both being the same, £12,000. These figures suggest that for each of those eight years the mills had together been producing only as much as and possibly less than, Woolley alone in the 1740s. The decline in overseas markets had thus left the mills with a productive capacity which not even the war had caused to be fully used. In 1803 therefore the Woolley partners entered into an agreement

with the proprietors of the Littleton works 10 miles south of Bristol, by which the two firms were to be 'consolidated'. As the Woolley lease was close to expiry but the Littleton site was freehold and owned by the partners, it was decided to concentrate production at the latter, although buildings and machinery at the former were to 'remain as they are, to be empld in case of emergency'³⁴. The firm thus lost its separate identity only a few years before Sir Henry's death in 1810 led to the exclusion of the Stracheys, and brought to an end this supply of documentary evidence.

Much less is known about the Littleton works, but the partners shared the same background as those at Woolley. From the mid-eighteenth century they included the following representatives of Bristol's mercantile, slave trading and banking worlds: Levi and Jeremiah Ames, Thomas Deane, Isaac Elton, William and Philip John Miles, William Miller, William Fowler and Samuel Shute. In addition to Littleton the partners operated on sites in the nearby parishes of Winford, Chew Magna and Chew Stoke, until the business was taken over by the national firm of Curtis and Harvey in the 1830s, shortly after which production ceased in the Bristol region. These closures may have had a greater effect in the city than the countryside because whilst the mills were not great employers of labour (12 men at the Woolley works in 1747/9, for example), most of the partners and merchants were based in Bristol, as were the coopers, braziers, plumbers, and carpenters named in the

Woolley accounts (and checked in the Bristol Directories), presumably because men skilled in the specialist port trades like barrel making, were employed in preference to rural craftsmen.

The need to consolidate the works shows how little the dividend can tell us about the efficiency of the capital employed in the physical assets, or indeed the future prospects of the firm. It was the partners' realization that high profits at the end of the eighteenth century showed not a thriving firm but only one faced with occasionally exceptional conditions in an otherwise contracting market, that led to the 'consolidation' of the companies.

ii The Joseph Percival and Copper Company of Bristol

X This company was like the powder works in that it operated on rural manufacturing sites in north Somerset, and was part of a larger network encompassing in this case the mining of copper in Cornwall and its smelting in South Wales. Its origins lie in the growing industrial activity at the start of the eighteenth century, associated with the wartime demand of those years, and with the adapation in Bristol in the later 1680s of the new coal-fired reverbatory furnaces from lead to copper smelting³⁵. The role of John Coster and Gabriel Wayne in this development led them across the Bristol Channel to work at smelting concerns set up in the 1690s at Upper and Lower Redbrook near

Tintern. Smelted copper was then shipped to Bristol, for the brass and copper works there and in north Somerset.

Whilst continuing his links with Upper Redbrook, John Coster also established a family partnership which became the Joseph Percival & Copper Co. in the 1740s and the John Freeman & Copper Co. in 1764. Their first water-powered site was a former fulling mill at Swinford on the River Avon, two miles upstream from Keynsham. It was leased in 1708 and converted into a rolling mill for sheet copper, thought to be the first to use this method in the area. By 1713 another mill had been leased eight miles to the south, Bye Mill on the River Chew flowing north to the Avon. This had been used for iron battery work, and the Costers were able to adapt it for use with the copper sheets produced at Swinford, hammering or battering them into hollow ware. John Coster died in 1718 but the business was carried on by his three sons who took over two more mills on the Chew. That at Pensford continued as a grist mill and may have been leased only to protect water rights or to ease river transport, although its warehouse was adapted for the storage of copper, but that at Publow was developed for refining, rolling, and battery work. A fifth mill at nearby Woollard was rented at the end of the eighteenth century. This expansion indicates success, and it has been suggested that they produced a large part of the copper battery ware sold in Bristol, valued for example in 1727 at £15,000³⁶.

During the 1720s the Costers' copper supplies were secured by having one brother in Cornwall and Devon, and by maintaining an association with the Upper Redbrook works. But two brothers died in the early 1730s, and the Upper Redbrook lease was taken over by the rival Bristol Brass Wire & Copper Co., to be studied later. To regain control over their resources the partnership set up a copper smelting works near Swansea. This was the White Rock Copper Co. which A.H. John described as having been set up in 1737 'by some of Bristol's leading merchants.... engaged in the slave and West Indian trade', whom he named as 'John Hoblyn and Partners'³⁷. The surviving Coster brother Thomas, M.P. for Bristol from 1734 until his death in 1739, was indeed engaged in the slave trade, undertaking six voyages in the 1730s as a shipowner; and in 1734 he had acquired as a new partner with a 1/3 share the slave trader Joseph Percival who long-continued in that business, appearing in the 1755 List of Traders to Africa. But who was John Hoblyn? No reference to a merchant of that name has been found, but in 1739 Thomas' daughter Jane inherited his fortune of £40,000, and in 1741 she married Robert Hoblyn, a Cornish tin mining attorney who became a partner in the firm and M.P. for Bristol from 1742 to 1754. Jane/John Hoblyn may therefore be a composite figure. Nevertheless the generalization about links with the Africa trade holds good, especially as these went beyond the provision of capital for this manufacturing concern to include the representation of these interests in Westminster in the mid-eighteenth century³⁸.

Limited evidence on the finances of the firm is provided by a Committee Book covering January 1762 to June 1769. Joseph Percival was no longer able to attend the monthly meetings, and until he died in February 1763 Isaac Hobhouse acted as the senior partner. Hobhouse has the distinction of having been selected by Minchinton as an example of the typical Bristol merchant who unlike his London counterpart functioned as wholesaler, factor, and shipowner, and by Latimer as one of the slave traders who should not 'be judged by the higher moral codes' of a later day³⁹. The investigation of his background which this apology invites reveals that Hobhouse pursued the trade with vigour. By 1747 he had conducted 72 voyages in the previous quarter century, and the 1755 List shows this activity continued. He held four of the Copper Company's shares. These were valued at £1,000 in 1764 and as each was one-thirtysixth of the whole it may be inferred that the capital stock subscribed by the partners was £36,000⁴⁰. The Committee Book contains evidence of the firm's growth on both sides of the Channel. For example at White Rock in 1750 there were eight calciners in which ore was heated until friable and 26 furnaces in which it was then smelted, whilst by 1762 there were 15 and 31 respectively. In 1764 it was decided to erect buildings for making brass in order to safeguard their position, for other firms (especially the William Champion & Warmley Co., near Bristol but in south Gloucestershire) had recently entered the market, and the partners feared this 'may in time probably lessen our sale'. This further vertical integration must have

increased the overall provision of fixed capital, and may have led to some of the borrowing from external sources described later. There was also expansion at Publow Mill where a new furnace was installed in 1761 and a new clay house in 1762, and at Bye Mill where a new oven was established in 1762. And from September 1762 the partners were able to meet in 'our Countinghouse in Small Street' instead of the Three Tons in Corn Street⁴¹.

Information on circulating capital is no easier to come by than that on fixed capital despite the elaborate Metal Account Books for the years 1756-98 and 1824-55, for these dealt in quantities only. However as the price of copper per ton was recorded for the years 1752 to 1760, see Table 8(2), column 4, it has been possible to value the stocks held at the annual count, column 3, in the period of overlap from 1756. The value of the stock held, shown in column 5 and averaging more than £69,000, gives some idea of the magnitude involved in this mid-eighteenth century case. Indeed, compared with several big firms in the metallurgical industries on evidence provided by Pollard, the value of raw materials alone at White Rock was greater than figures covering stocks and stores elsewhere⁴². As the White Rock figures pre-date Pollard's earliest by 25 years, the Warmley Co. founded in 1746 may provide a closer comparison. Here stocks and stores were valued in 1767 at £102,000 and fixed capital at £105,000⁴³. These figures suggest that on balance the raw materials held at White Rock may have been

Table 8(2): Value of Stocks of Copper Ore at the White Rock Copper Refinery of Joseph Percival and Copper Company, 1756-1760

	1	2	3	4	5
				Average Annual	Value of Stock
Year	Copper Ore Delivered Tons	Copper Ore Smelted Tons	Copper Ore On Hand Tons	Price of Copper Ore Per Ton £ s d	of Copper Ore £ s d
1752		2,689		96 18 0	
1753		2,617		95 17 0	
1754		2,871		92 0 0	
1755		2,904		91 14 0	
1756		3,228	653	86 0 0	56,158 0 0
1757	3,396	3,272	777	84 4 0	65,423 8 0
1758		3,513	466	84 11 0	39,400 6 0
1759	3,422	2,908	981	80 2 0	78,578 2 0
1760	3,301	2,960	1,322	80 1 8	105,870 3 4

Source: B.A.O. 12171(1). "Account and Memoranda Book of the White Rock Copper Refinery, Llansamlet", 1749-1798.

- NOTE:
- 1 The metal account was drawn up annually on June 30th.
 - 2 Cols 1 and 2 show the ore delivered and smelted in the course of the year.
 - 3 Col 3 shows the stock of copper ore on June 30th.
 - 4 Col 4 shows the "average annual price" as calculated on June 30th.
 - 5 Col 5 shows the value of stocks of copper ore held on June 30th. Over the five years for which this information is available, these raw material stocks averaged £69,000 in value.

greater in relation to the whole than at Warmley, perhaps due to differences in the structure of the firms for whilst Warmley was planned as a comprehensive factory smelting copper, making brass, producing zinc by a new method, and fabricating copper and brass goods in the one unit, the Percival Copper Co. had grown in a pragmatic, organic way, its fixed capital dispersed amongst scattered locations. The need to carry materials around these sites may have placed a greater emphasis on circulating capital than would otherwise have been the case.

The validity of this interpretation depends on the extent to which the north Somerset mills formed an integral part of the company's operations, and fortunately the Committee and Metal Account Books allow the matter to be examined more fully, see Tables 8(3) & (4). First, the importance of the Publow Refinery grew during this time, for in 1750 it produced 13.0 per cent of the firm's output of copper smelted, and White Rock 87.0 per cent, but by 1756 the proportions were 19.3 and 80.7 per cent respectively, and in 1762 they were 21.0 and 79.0 per cent. But Publow could not supply all that rolled and battered in north Somerset, so some had to be shipped from White Rock. Allowing for some double counting if that rolled at Swinford Mill went on to the battery works, the north Somerset mills would still have taken 15 to 30 per cent of the refined copper from White Rock, making them probably the largest outlet at the time. The rest would have gone to merchants in the Africa trade, for the Metal Account Book commonly included barter goods such as

Table 8(3): Copper Smelting at the White Rock Refinery, Output and Costs 1750-1762

From June 1749 to July	Copper Ore Smelted Tons	Copper Made Tons	Coal Used Wey Carts 8ths	Smelting Charges in all £ s d	Wages and Salleries £ s d	Ore Smelted Weekly Tons	Cost of Coal per ton of Ore s d	Wage per ton of Ore s d	Other Charges per ton of Ore £ s d	Within our Scheme s d s d	Above our Scheme s d s d	Furnaces	Calciners
1750	2,566 16 2 343 0 3	1,559 14 0	6,695 4 7 1,735 7 0	49 $\frac{3}{8}$	12 9 13 6 $\frac{1}{8}$	1 5 10 $\frac{7}{8}$	7 4 -	26 8					
1751	2,747 3 0 360 12 1	1,529 0 0	6,503 18 2 1,667 4 4	52 $\frac{6}{8}$	11 8 $\frac{2}{8}$	12 1 $\frac{5}{8}$	1 3 6 $\frac{2}{8}$	12 7 $\frac{7}{8}$	-	28 8			
1752	2,688 18 0 368 14 0	1,602 21 0	6,668 9 2 1,719 12 9	51 $\frac{5}{8}$	12 6 12 9 $\frac{3}{8}$	1 4 3 $\frac{6}{8}$	10 4 $\frac{7}{8}$	-	26 8				
1753	2,617 2 2 403 1 0	1,608 0 0	6,535 15 0 1,728 19 5	50 $\frac{2}{8}$	12 10 $\frac{6}{8}$	13 2 $\frac{4}{8}$	1 3 10 $\frac{7}{8}$	10 0 $\frac{5}{8}$	-	26 8			
1754	2,871 17 3 389 7 0	1,541 21 0	6,546 6 8 1,814 7 5	55 $\frac{1}{8}$	11 3 $\frac{2}{8}$	12 7 $\frac{4}{8}$	1 1 8 $\frac{2}{8}$	14 5 -	26 8				
1755	2,903 12 1 423 3 1	1,584 0 0	7,315 18 0 1,969 18 3	55 $\frac{6}{8}$	11 5 $\frac{4}{8}$	13 6 $\frac{6}{8}$	1 5 4 $\frac{2}{8}$	9 7 $\frac{4}{8}$	-	26 8			
1756	3,227 15 3 389 16 2	1,689 7 0	7,877 8 2 2,121 5 5	62	10 11 $\frac{6}{8}$	13 1 $\frac{5}{8}$	1 4 6 $\frac{2}{8}$	11 2 $\frac{3}{8}$	-	26 8			
1757	3,271 10 1 421 8 3	1,839 19 3	8,069 12 9 2,129 9 9	63	11 9 $\frac{4}{8}$	13 0 $\frac{1}{8}$	1 4 6 $\frac{7}{8}$	10 8 $\frac{2}{8}$	-	26 8			
1758	3,513 2 0 453 7 0	2,053 3 7	8,778 4 8 2,296 5 10	67 $\frac{4}{8}$	12 0 $\frac{2}{8}$	13 1 1 4 10 $\frac{3}{8}$	10 0 $\frac{3}{8}$	-	31 14				
1759	2,907 15 2 364 9 3	1,815 17 4	7,437 19 0 1,999 11 2	56	12 10 $\frac{2}{8}$	13 9 1 4 6 $\frac{5}{8}$	8 10 $\frac{2}{8}$	-	31 14				
1760	2,959 15 1 398 4 1	2,057 6 0	7,903 14 1 2,318 9 4	57	14 3 $\frac{4}{8}$	15 8 1 3 5 $\frac{7}{8}$	6 7 -	31 15					
1761	2,858 1 0 488 6 2	2,164 18 6	8,545 18 1 2,316 11 10	54 $\frac{7}{8}$	15 7 16 2 $\frac{4}{8}$	1 8 0 0 2 $\frac{1}{2}$	-	31 15					
1762	2,666 7 3 399 9 1	1,932 9 5	8,034 14 3 2,243 7 5	51 $\frac{2}{8}$	14 11 16 9 $\frac{7}{8}$	1 8 6 $\frac{3}{8}$	-	0 3 $\frac{2}{8}$	31 15				

Source: B.R.L. B 4771. "The Committee Book of the Joseph Percival and Copper Company", 1762-1769.
 NOTES: 1 This table is reproduced from the Committee Book, 6 December 1762.
 2 0 = 1 hundredweight,
 2 = 1 quarter.

Table 8(4): Output and Cost at the North Somerset Mills of the Joseph Percival and Copper Company, 1750-1766

Source: B.A.O. 12171(1).

From June 1749 to June 30	Publow Refinery				Bye Mill				Publow Mill				Publow Trip Hammer				Swinford Mill			
	Copper Laded	Wast	Cost of Meltg per lb		Copper Batter'd	Wast	Cost per e		Copper Bat'd	Wast	Cost per e		Copper Bat'd & Roll'd	Wast	Cost per e		Copper Roll'd	Wast	Cost per e	
	e 2 lb	e 2 lb	d		e 2 lb	e 2 lb	s d		e 2 lb	e 2 lb	s d		e 2 lb	e 2 lb	s d		e 2 lb	e 2 lb	s d	
1750	1,028 0	2 22 0	8	3 $\frac{1}{8}$	801 2 11	5 3 7 12	7 $\frac{3}{8}$		628 1 18	6 2 1	16 $\frac{1}{8}$		647 3 1	17 3 7 11	2 $\frac{4}{8}$		1,312 0	20 42 3 17 11	2 $\frac{2}{8}$	
1751	942 3	8 14 1	13	10 $\frac{1}{8}$	714 3 8	9 2 19 12	10 $\frac{6}{8}$		632 1 16	5 3 24	14 6		652 2 4	9 1 8 11	8		823 1 21	24 0 25 13	3 $\frac{1}{8}$	
1752	1,182 2	24 22 2	23	10 $\frac{1}{8}$	558 2 14	7 0 5 14 11	4		583 0 4	7 3 15	14 10		818 1 27	12 1 11 9	0 $\frac{1}{8}$		878 2 9	25 3 19 12	0 $\frac{1}{8}$	
1753	923 1 21	6 1 21		8 $\frac{1}{8}$	613 2 26	7 3 18 11 4			634 0 26	7 0 27	9 11		742 0 4	16 3 21 11	5 $\frac{1}{8}$		882 3 2	33 1 23 12	6 $\frac{1}{8}$	
1754	1,609 1	2 13 2 9		3 $\frac{1}{8}$ bare near	868 0 3	7 0 4 9 5			773 0 2	9 3 12 10	6 $\frac{2}{8}$		1,001 0	27 17 3 5 9 11			662 1 18	33 0 18 14	6 $\frac{6}{8}$	
1755	1,710 0	5 27 0 3		3 $\frac{1}{8}$	1,047 1 27	9 0 6 8	5 $\frac{2}{8}$		887 3 14	12 0 16 10 1			1,059 0	2 3 3 12 9	4 $\frac{1}{8}$		824 0 15	33 0 0 11	7 $\frac{4}{8}$	
1756	1,860 2	22 7 3 8		10 $\frac{1}{8}$	1,011 0 16	11 2 9 9 2			746 2 27	7 1 20 14 11	1 $\frac{1}{8}$		1,199 0	18 35 3 18 10 11			919 0 27	45 2 0 13 1		
1757	1,569 0	15 11 1 22		10 $\frac{1}{8}$	947 3 5	7 2 25 9 2			788 3 16	5 0 24 12 8			1,079 2	17 30 2 23 10 11			957 0 4	36 3 20 12 18	1 $\frac{1}{8}$	
1758	1,508 3	17 3 3 9		10 $\frac{1}{8}$	892 3 3	19 3 3 10 10	6 $\frac{5}{8}$		739 3 25	4 1 18 10	5 $\frac{5}{8}$		710 1	7 5 3 13 14 3			700 2 23	25 2 22 14 6		
1759	1,868 2	1 11 2 27		10 $\frac{1}{8}$	902 0 6	11 1 22 10	6 $\frac{5}{8}$		755 2 5	11 0 2 11	6 $\frac{1}{8}$		1,108 3	21 19 2 7 9 10			1,092 2 24	46 0 24 12	9 $\frac{3}{8}$	
1760	1,790 1	21 ---		10 $\frac{1}{8}$	915 3 13	11 1 7 8 9	9 $\frac{5}{8}$		717 0 13	8 3 8 9	9 $\frac{2}{8}$		1,062 0	13 30 1 17 10 3			987 1 26	35 0 24 12	6 $\frac{1}{8}$	
1761	2,350 3	8 ---		10 $\frac{1}{8}$ near	1,004 0 11	13 2 1 9 10	4 $\frac{1}{8}$		914 1 14	21 3 8 11	9 $\frac{4}{8}$		1,372 1	16 46 0 7 10 1	5 $\frac{1}{8}$		1,197 0 23	34 1 2 10	6 $\frac{6}{8}$	
1762	2,113 0	5 25 1 17		10 $\frac{1}{8}$ & more	1,016 3 5	15 1 23 10	7 $\frac{8}{8}$		831 3 12	15 3 11 $\frac{1}{8}$	11 0		1,309 3	14 14 2 16 $\frac{1}{8}$	7 11 $\frac{1}{8}$		1,468 1 25	34 2 25 9	7 $\frac{6}{8}$	
1763	1,738 0	13 17 3 18		10 $\frac{1}{8}$ & more	1,215 3 19	27 3 6 8 3	4 $\frac{4}{8}$		688 0 22	16 2 23 12 5	3 $\frac{3}{8}$		1,106 2	24 20 1 0 9 8	4 $\frac{4}{8}$		1,157 0 7	24 1 4 8	9 $\frac{3}{8}$	
1764	1,690 3	2 15 2 19		10 $\frac{1}{8}$ & more	853 0 9	21 1 17 12 1	1 $\frac{1}{8}$		783 0 9	17 2 10 $\frac{1}{8}$	14 10 $\frac{7}{8}$		1,012 1	23 23 2 16 9 10	7 $\frac{7}{8}$		1,063 2 14	26 3 21 10 10	2 $\frac{2}{8}$	
1765	1,794 2	21 12 0 16		10 $\frac{1}{8}$ & more	831 0 2	22 0 19 10 8	3 $\frac{3}{8}$		962 3 25	16 1 16 10 4	4 $\frac{4}{8}$		1,118 1	3 28 3 4 9 5	2 $\frac{2}{8}$		1,071 2 13	7 3 0 8 4	5 $\frac{5}{8}$	
1766	1,677 1	1 25 1 27		10 $\frac{1}{8}$ & more	1,084 2 4	25 2 21 9 10			926 1 15	9 2 1 12 9	1 $\frac{1}{8}$		1,542 3	21 37 3 27 9 1	1 $\frac{1}{8}$		1,354 0 14	34 0 16 10 0	5 $\frac{5}{8}$	

'manillas', and to brass works at White Rock, Bristol and the Midlands. Carrying Cornish copper to White Rock, and the refined product to dispersed works and customers, provides a good reason for high inventory stocks.

This scattering of interests also presented the Bristol-based company with problems of management and organization. In 1768 for example the managing partner Thomas Dymock had to travel to Cornwall to appoint a new assayer, the previous one having been 'exceedingly deficient in attention to our business'⁴⁴. There were problems at White Rock too, for it came to the partners' attention that smelting charges for the year ending 30 June 1762 were nearly £1,400 higher than the comparable period in 1753, when similar work had been carried out. As a result of the detailed calculations made, shown in Table 8(3) already referred to, the manager John Phillips was recalled to Bristol to explain the deficiencies and to take a salary cut of £50 per annum till the earlier position was restored⁴⁵. It is curious that in their close analysis of the situation no mention was made of the new items of fixed capital noted earlier and shown in the last columns of Table 8(3), neither to seek from these a possible reason for the increase in costs, nor to draw attention to the little if any increase in the amount of ore smelted weekly. It seems the partners were not concerned with maximizing production but with minimizing costs, and so did not consider the possibility that by increasing the number of calciners and furnaces without

increasing the raw materials worked, cost efficiency may have been impaired through higher overheads, wages, and fuel bills. There may have been similar problems at Swinford Mill⁴⁶ for in 1763 one of 'two Thompsons' employed there was dismissed. But the analysis of production costs for the years 1750 to 1766 seen in Table 8(4), shows that on their own terms the position in north Somerset must have been better than at White Rock, for although the quantities handled had increased, unit costs had in all cases decreased.

Although both the Percival company and the Woolley works were based largely on Bristol finance, there were important differences between them. In the mid-eighteenth century the joint capital and number of partners of the former was three to four times greater than the latter, and far from allowing power to be concentrated in fewer hands as at Woolley, the Copper Co. sought to limit holdings, especially after Joseph Percival's death in 1764 when it was agreed that no partner should hold more than 6 shares. On the sale by Mrs. Elizabeth Percival of her husband's 12 shares, the old partners (John Freeman and son John, John Hobhouse, John Heylin, Thomas Dymock, William Philips, and Thomas Rous) were joined by 6 new ones, with more substitutions later in the decade as shares changed hands. Apart from Thomas Rous, a Gloucestershire gentleman and father-in-law of one partner, and Dr. Abel Moysey, a Bath physician, the partners were all Bristol merchants, many of them involved in the slave trade. John Freeman sr. was in the 1755 List, as

were John Hobhouse, son of Isaac, Thomas Dymock, James Bannister a sugar-baker, and Samuel Munckley, the West Indian merchant whose ships the Iris and Culloden traded to Africa in the 1740s. Of all the partners traced, nearly 40 per cent had been engaged in the Africa trade.

It has already been recognized^{that} for the copper industry in general the record of external finance was greater than for other industries, and that for South Wales in particular much of the industrial capital came not only from outside the firm and also from outside the region⁴⁷. As a copper company with an interest in South Wales it was therefore likely that loans from external sources would be significant in the financing of the Percival Copper Co., and this has proved the case. The available evidence has been summarized in Tables 8(5) & (6), and an account of the system of classification follows in Figure 1. Borrowings over the period 1763-69 totalled £78,738, of which about 1/3 each came from banks, women, and other private sources. But these loans were not cumulative, only those from Mrs. Elizabeth Percival carrying no record of repayment. In her case they came to £16,495 at 5.0 per cent in the given years, and formed a long-term investment in the company with which her late husband had been closely connected. But most were short-term, taken up to ease the finances of the firm. Bank loans were the most rapidly repaid, being held for an average of 4.4 months at 5.0 per cent. Other loans were held for an average of 46.8 months, at 4.0 per cent, with the exception of one of £650

Table 8(5): Classification of Loans Borrowed by the Joseph Percival and Copper Company 1763-1769
showing the total sum from each source, and the proportion this represented of the borrowing for the year.

Year	Capital Raised		I	II	III	IV	V	VI	VII	VIII	IX	X	
	Sources		Peers	Gentry	Yeomen	Capit-	Manu-	Trades-	Profes-	Clergy	Women	Institutions	
	Total	other than Banks				alists	facturers	men	sionals			Parishes	Banks
	£	£	£	£	£	£	£	£	£	£	£	£	£
1763	14,730	9,950		100 0.7%		2,000 13.6%		(1,100) 7.5%			6,600 44.8%	150 1.0%	4,780 32.4%
1764	25,218	18,218		4,100 16.2%		2,160 8.6%		(900) 3.6%	433 1.7%	500 2.0%	9,945 39.4%	180 0.7%	7,000 27.8%
1765	4,490	4,490				1,360 30.3%		(1,200) 26.7%	200 4.5%	500 11.1%	1,000 22.3%	230 5.1%	
1766	10,570	3,270					3,000 28.4%					270 2.5%	7,300 69.1%
1767	1,330	1,330				1,000 75.2%						330 24.8%	
1768	12,350	11,350				3,000 24.3%					8,350 67.6%		1,000 8.1%
1769	10,050	2,650					2,000 19.9%	(150) 1.5%			500 5.0%		7,400 73.6%
Total	78,738 100%	51,258 65.0%		4,200 5.3%		9,520 12.1%	5,000 6.3%	3,350 4.2%	633 0.8%	1,000 1.3%	26,395 33.5%	1,160 1.5%	27,480 35.0%

Source: B.R.L. B 4771. "The Committee Book of the Joseph Percival and Copper Company", 1762-1769.

- NOTES: 1 See Appendix I for the system of classification.
2 Brackets indicate a classification which is probable but not certain. Some of the tradesmen of Column VI may have been merchants, although this is unlikely in view of the absence of their names from merchanting records.
3 Column VII includes salaried employees of the firm rather than attorneys and medical men as was more commonly the case.

Table 8(6): Bristol Banking Partnerships Making Loans to the Joseph Percival and Copper Company, 1763-1769

	1750 Messrs. Matt. Hale & Co. (Old Bank) £	1750 Messrs. Lloyd, Elton & Co. (Old Bank) £	1752 Messrs. Goldney, Smith, Champion & Co. (Miles Bank) £	1760 Messrs. Bright, Dean, Ames & Co. (Harford Bank) £	1764 Messrs. Tyndale, Swymmers & Co. (Exchange Bank) £
1763	1,600		3,180		
1764		1,000	3,000		3,000
1765					
1766		6,300	1,000		
1767					
1768		1,000			
1769		4,000		3,400	

Sources: 1 B.R.L. B 4771. "The Committee Book of the Joseph Percival and Copper Company", 1762-1769.
2 Cave, Banking in Bristol.

- NOTES: 1 Columns are headed by the probable date of foundation of the bank partnership, the name by which it was referred to in the Committee Book and, within brackets, the name by which the bank was later known.
2 The table shows that the original partnership of the Exchange Bank was formed by at least 1764 and not 1766 as Cave suggests.
3 An Indenture of Partnership (B.A.O. 28048, P/83(1)) shows the Harford Bank to have been founded in 1760 and not, as Cave suggests, in 1769.

Figure 1: A Note on the Classification of Sources of Capital in North Somerset, 1750-1830

- I Peers
- II Gentry, including baronets, esquires and gentlemen living at rural addresses who may have been mining proprietors or clothiers as well as landowners.
- III Yeomen, farmers, graziers and rural tradesmen such as blacksmiths, butchers and victuallers.
- IV Capitalists, taken here to include substantial merchants, bankers and rentiers or urban gentlemen.
- V Manufacturers, including brewers, maltsters and distillers because of their economic function, and because they were so classified by P.Colquhoun, A Treatise on the Wealth, Power and Resources of the British Empire(1814), pp.124-5.
- VI Tradesmen, including wine merchants, victuallers and craftsmen such as upholsterers, carpenters and saddlers.
- VII Professional men including attorneys, surgeons, apothecaries, architects, musicians and salaried employees.
- VIII Clergymen.
- IX Women, including widows, daughters, spinsters, lodging house keepers and servants, and therefore not strictly speaking a social and economic group.
- X Institutions, a term covering municipal corporations, parishes, hospital trustees, banks and associations of artisans.

Investors have been classified by a cross-referencing of the documents studied, supplemented where possible by information from directories and legal material like property leases.

The system of classification is substantially that used by J.R. Ward for canal investors, The Finance of Canal Building in Eighteenth-Century England(Oxford,1974), pp.18-26, but with modifications to meet the needs of a study of one region over a period of time. For example, institutions have had to be accommodated, and the definition of professional extended, and it has seemed appropriate to classify some such as brewers as manufacturers. Also, allowances have been made for changes of status over time. An earlier occupation may have remained the source of income, but the designation of a maltster or wine merchant as esquire by his contemporaries indicates a change of the scale of operations which suggests a classification in IV, rather than V or VI as previously.

in 1764 at 4.5 per cent. It is difficult to generalize on the relationship between the size of the loan and its repayment, for although many of the longer-held ones were small sums of £100 or £250 lent by women, three totalling £5,360 at 4.0 per cent in the years 1764 to 1768, not repaid until 1776, were from Thomas Jones, master of slave ships in the 1750s, named in the 1755 List, and a slave merchant in the 1760s. Four Bristol banks making loans to the Copper Co. appear in Table 8(6). It can be shown that of their partners nearly 60 per cent had associations with the slave trade. They were: Jeremiah Ames, Henry Bright, Thomas Deane, Isaac Elton, Matthew Hale, Michael Miller, William Miller, James Read, Morgan Smith, William Swymmer, John Vaughan, and Thomas Whitehead. In addition, four were associated with gunpowder and five with brass works.

The limited information on the finances of the firm has been set out in Table 8(7), with explanatory notes. In the period covered interest at 5.0 per cent was paid on the shares, each valued at £1,000⁴⁻⁸. This rate plus the annual net profits expressed as a percentage of the partners' capital of £36,000, together make up the dividend. It is notable that in the years 1765 and 1767 when profits of 15.1 and 8.0 per cent were declared, exclusive of the rate of interest, fresh borrowings were in each case less than £5,000, with nothing from the banks. In 1764 however, when despite a balance of £616 in the Profit and Loss Account a net loss of £207 was declared because £823 was allotted to the 'Accot of Dubious Debts' to

Table 8(7): The Finances of Joseph Percival and Copper Company, 1762-1769

Year	1	2	3	4	Returns to Partners' Capital		
	Capital	Cash	Profit and	Net	Profit	Interest	Dividend
	Borrowed £	Balance £	Loss Account £	Profit £	%	%	%
1762	No infor- mation	2,221	1,184	1,462	4.1	5.0	9.1
1763	14,730	352	665	604	1.7	5.0	6.7
1764	25,218	844	616	-207	-0.6	5.0	4.4
1765	4,490	2,136	6,854	5,440	15.1	5.0	20.1
1766	10,570	1,435	527	-1,353	-3.8	5.0	1.2
1767	1,330	1,224	4,711	2,895	8.0	5.0	13.0
1768	12,350	3,316	4,627	2,882	8.0	5.0	13.0
1769	10,050	594		No information			

Source: B.R.L. B 4771. "The Committee Book of the Joseph Percival and Copper Company", 1762-1769.

NOTES: Col 1 These figures show capital borrowed during the calendar year.

Col 2 The cash balance was recorded at each monthly committee meeting. Shown here are those for June, chosen because the accounts were balanced on the 30th of that month, and the Profit and Loss Account then declared

Col 3 Unfortunately the Committee Book contains only extracts from these several accounts, but their calculation, especially the Profit and Loss Account, indicates a greater degree of accounting skill than was required for the annual balance of assets and liabilities.

Col 4 Net Profit was what remained after all costs (including interest charges) had been met. These figures do not agree with the Profit and Loss Account because a further sum was usually debited from this to the Account of Dubious Debts to cover possible losses not yet accounted for. Net losses in 1764 and 1766 were met by partners according to their respective shares.

meet any further claims, the partners had to raise more than £25,000 to ease their difficulties. This borrowing requirement may have been due in part to the building of the brass mill at White Rock, following closely on investments at Publow and Bye Mill. The Metal Account Book shows that by 1765 copper was being delivered to the new brass works and the high profits that year may reflect its activity. Why then the loss the following year? Perhaps this was due to a shipwreck, for in January 1766 an extra-ordinary committee meeting was held at which the partners discussed the possible recovery of the Pendarris, stranded on the Glass(?) Sands⁴⁹. Even if eventually recovered, or insurance received, the delay in receiving raw materials may have caused the losses of that year in an episode which provides some justification for the large stocks of raw materials normally held by the firm

As the John Freeman & Copper Co. the firm continued to operate to the 1860s, when legal battles between descendants of earlier partners led to a dissipation of resources and sale of assets.

iii The Brass Industry of the Bristol Region

Brass is an alloy of copper and zinc and its manufacture in this region was encouraged by both the better copper becoming available from the beginning of the eighteenth century, and the proximity of good supplies of calamine, the carbonate ore of

zinc which was discovered on the Mendips in 1566 and then mined in the way already discussed. The technology of this new industry, its development on water-powered sites in the region in the pattern now familiar from the gunpowder and copper works, and the relations between this industry and its competitors in copper and brass production elsewhere, have been outlined in the earlier study by Joan Day. To this general account can now be added an analysis of the financial structure of the main firm, the Bristol Brass Wire & Copper Co., based largely on new evidence from the papers of the Dickinson and Harford families. The former were sugar merchants and West Indian plantation owners, holding joint stock in the Brass Co. from 1747 until bought out in 1787 by a partnership composed largely of members of the Harford family, sugar and iron merchants, and bankers, with an interest in the company from 1748. Both families were Quakers from a rural background in Somerset and Hertfordshire respectively. Both married into successful Bristol merchant families, the Prankards and Goldneys in the case of the Dickinsons, and the Battersbys and Scandretts in that of the Harfords. Even with the discovery of these papers our ignorance might have remained, for some were written in a cypher which has had to be broken⁵⁰.

The origins of the Brass Co.⁵¹ lie early in the eighteenth century when Abraham Darby and three Quaker colleagues set up the works at Baptist Mills in Bristol. In 1706 their numbers doubled, and an unchartered joint stock company with transfer-

able shares was formed. The existing capital stock of £5,836 was increased to £8,000, with provision for a further rise to £12,000. But Darby became more interested in cast iron and withdrew to a foundry where one of his partners was the Quaker Graffin Prankard. By 1708 the company had acquired a mill on the River Avon at Keynsham, initiating the links with north Somerset. In 1709 there was a juncture with the Brass Wire Works at Esher, which increased the 64 shares in the Bristol Brass Co. to 80. The joint stock was to be allowed to reach an upper ceiling of £50,000. By 1720 it was feared that the company might be contravening the recently passed Bubble Act, but the advice of the Prime Serjeant at Law was that they should be allowed to maintain their status but with no further increase in the numbers taking part.

Under the leadership of Nehemiah Champion further mill sites were acquired along the Avon in the 1720s, the decade in which the river was made navigable. In 1721 copper works were built at Saltford, four miles above the brass works at Keynsham, although the company's main smelting site continued to be at Crew's Hole on the Avon at Bristol. By the late 1720s a brass battery mill had been set up at Weston just west of Bath, and other mills were leased for this purpose at Woodborough and Chew, on the River Chew where the Coster brothers were already established. In the 1730s the company took over the Upper Redbrook works (as noted in relation to the Percival & Copper Co.), and took the name of The United Brass Battery Wire &

Copper Co. of Bristol, Esher, Upper Redbrook, and Barton Regis. Copper supplies were further safeguarded by the acquisition of the Elton & Wayne works at Conham two miles upstream of Bristol Bridge, on the bankruptcy of Sir Abraham Elton in 1745. A report of 1754 reveals the scale of operations in Bristol, with 66 furnaces producing copper for the brass works. But the Warmley works of William Champion & Co. posed a growing threat, especially in the 1760s when they looked to incorporation as a way of solving their pressing capital requirements. This move was opposed by 10 companies (including the Bristol Brass Co. and the John Freeman & Copper Co.) on the grounds that the planned growth at Warmley, where the proposed new capital was £400,000, would deprive them of their trade. Despite his great resources as a Bristol merchant and shipowner, trading to Africa and named in the 1755 List, William Champion had overreached himself with this scheme. He was bankrupted, and in 1769 the Warmley Works were bought by the Bristol Brass Co.

A local difficulty had been overcome but the Bristol company then found its position challenged by outsiders, as mining developments on Anglesey led Birmingham manufacturers to form a Metal Company to provide cheaper brass from copper mined there. In Bristol these problems were met by a re-formation of the old company in which the joint stock was purchased by a small partnership, made up largely of members of the Harford family and known as the Harford & Bristol Brass & Copper Co.. Despite such a fundamental change in its legal and financial base the

company remained traditional in output and method, and so less flexible in response to new demands than the Birmingham firms. It therefore gradually declined, and mills were sold off or rented out until by 1833 only three were left on the Rivers Chew and Avon, and these were leased out to a partner. The company itself was no longer a manufacturing concern.

This account raises but does not answer a major question. If from the 1770s the company was under the pressures described, why were the Harfords, astute and successful merchants and bankers, so eager to take it over? Is it possible that the external challenges were less serious than generally thought, or that the company was more profitable than later writers have indicated?

There is little doubt that by the 1780s the company's fortunes were felt to be declining. This is shown by changes in that useful barometer of joint stock well-being, the value of its shares. In the 1740s these had changed hands at £170 as Table 8(8) shows, rising in the course of the 1750s to £250. This produced a capital gain of nearly 36.0 per cent on his original purchase when Caleb Dickinson sold 5 shares in 1759, and a putative gain of 12.4 per cent for Edward Harford when he transferred details to a new ledger at the end of 1768, noting 'To Profit and Loss for the value more than they cost...'. His gain would have been greater but for later purchases at a higher price. Shares reached £260 in 1771 when Caleb Dickinson

Table 8(8): The Changing Value of the Shares of the Bristol Brass Wire and Copper Company, and the Returns (profit plus interest) to the Shareholders' Capital, 1747-1787

Year	Dickinson Shares £	Harford Shares £	Dividend %	Year	Dickinson Shares £	Harford Shares £	Dividend %
1747	170			1771	260		
1748		170	5.3	1777	250		
1749		170	5.3	1780		238.50 b) (250)	4.0
1750	205		5.3	1781	a) 225	c) 218.75 d) 228.60	4.4
1751-55			4.9	1782	230		4.5
1756		220		1783			4.6
1757-58			4.6	1784		(250)	4.9
1759	250		4.6	1785		230	4.9
1760-64			5.3	1786	210		4.5
1765		250	5.3	1787			4.0
1766-67			4.9	1787-92 Remaining shares bought out for £306.			
1768		250					

Sources: Dickinson Shares: S.R.O. DD/DN, 405 Ledger A; Bundles 240, 241, 243, 247, 253, 255, 256, 259, 264.

Harford Shares: B.A.O. 28048, Ledger Fl/1, Journal F5, Ledger F 2/1, Journal F 6/1.

NOTES: 1 Brackets indicate an inheritance of shares and not a purchase.
2 The range of values for 1781 show a) market price,
b) inheritance value, c) and d) ledger evaluation.

bought two each for his brother Vickris and son William. But when Edward Harford inherited 16 shares from his father in 1781 he revised his initial valuation of them in his journal of £250 each, to £228.12s.0d each for his holding of 32 shares. This was a realistic move for shares were sold in Bristol that year at £225, and at £230 until the mid-1780s. By 1786 Barnard Dickinson was selling at the even lower price of £210⁵². The influence of the low rate of return to shareholders' capital will be left aside for the moment in pursuit of external factors, but it is worth noting from this table that for much of the period the dividend of interest and profit was below 5.0 per cent.

The early 1780s were a bad time in which to find purchasers of shares in Bristol. Advertisements in local papers produced enquiries but no buyers. Letters to William Dickinson noted a 'dullness' of trade and scarcity of money, at a time when the closure of American markets brought some Bristol merchants to bankruptcy⁵³. But trade in general recovered at the end of hostilities and Bristol shared in a prosperity which makes it difficult to blame economic conditions in general for the continuing decline in the company's fortunes. Instead, this may have owed more to trade competition, of which the shareholders were made aware in the annual reports for 1779-1784. The problems revealed are reminiscent of the situation faced by the powder makers who saw their future threatened by the loss of the American market and of the Africa trade for which barter

goods were made, but in the brass industry the competition of other firms was felt more strongly, as the Bristol company found itself consistently undersold by others in relation to the East India Co., the navy, and home customers, despite fixed price agreements designed to prevent this⁵⁴.

The balance sheets accompanying these reports to the General Meetings form the basis of Table 8(9). They confirm the gloomy story, especially in terms of the dividend in column XV, and the rate of return to share capital in column XVI (Part A). There are small discrepancies between these percentages and those in Table 8(8), as the returns in the latter were related to the individual holder's evaluation of his stock, whereas they are here related to the General Joint Stock, see column XIV. In 1782 the Bristol Committee (with five Harfords out of nine members) claimed that business was 'carried on with such great fatigue, and requires such constant attendance that your Committee can hardly go through with it', and indeed had a 5.0 per cent rate of interest had been counted as a cost it would have been in the shareholders' interest for the firm to have stopped trading. Yet within a few years the Harfords had purchased the firm, presumably because their private analysis of the situation led them to conclude that the brass and copper industry, producing goods in great demand in an industrializing nation even if overseas markets had become uncertain, had sufficient potential to accommodate both newer competitors and the old Brass Co., provided it was re-formed and re-organized.

Table 8(9), Parts A, B, C: Analysis of the Changes in the Structure of the Bristol Brass Company, 1779-1792

Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII
	Fixed Capital	Circulating Capital	Fixed Capital as percentage of I+II	Trade Credit		Balance of Trade Credit	Financial Assets				Administrative Balance	Financial Liabilities	Financial Balance	General Joint Stock	Dividend (Interest + Profit)	Rate of Return on Share Capital	Number of Shares on Which Dividend Paid	Number of Share Holders
				Debtors	Creditors		Held by Bristol Treasurer	Bankers	Government Stock	Reserve in Profit & Loss Account								
	£	£	%	£	£	£	£	£	£	£	£	£	£	£	£			
PART A																		
1779	15,318	141,697	9.8	64,199	41,841	22,358	3,959 (+ 10,265 with London cashier)			5,000	-606	23,311	-4,693	156,895	7,505	4.8	790	93
1782	15,412	105,436	12.7	87,321	32,854	54,467	763	3,936	3,185	5,000		9,983	2,901	160,180	7,900	4.9	708	90
1783	15,444	100,920	13.3	68,902	36,356	26,546	946	8,978		5,000	-462	1,336	13,126	143,862	7,434	5.2	708	87
1784	15,387	108,609	12.4	68,147	36,668	31,479	414	4,435	2,974	5,000	-1,939	3,893	6,991	142,215	8,364	5.9	697	86
PART B																		
1788		27,935		57,054	40,679	16,375	3,476	14,008	12,186				29,670	73,980	Compensation per share 1787- £100 1788- £110		618	66
1789		8,661		23,300	7,056	16,244		10,207	13,082	-3,000	452	13,149	7,592	32,497		£ 60	618	No information
1790		1,598		6,357	1,515	4,842	243	1,410	11,675			11,756	1,572	8,013		£ 20	586	35
1791				2,373		2,373	551	539	8,204		-316	2,984	5,994	8,366		-	303	34
1792							196	184	7,822		21	3,032	5,191	6,704		£ 16 £306	No information	
PART C																		
							Financial Assets. Shares of Old Company £	Administrative Balance £	Financial Liabilities			Financial Balance	Partners' Capital	Net Profit	Rate of Return to Partners' Capital. Profit %	Number of Shares	Number of Partners	
									Partners' Loans £	Borrowed Stock £	Executors & Trustees £	Bristol Fire Office £						
1789	16,758	58,413	22.3	30,603	9,610	20,993	750	-353	6,779	4,025	4,752	10,006	-25,165	71,000	10,792	15.2	71	9
1790	18,200	55,439	24.7	41,433	6,109	35,324	300	-369	16,511	10,225	1,045	10,112	-37,962	71,000	8,875	12.5	71	9
1791	18,572	73,054	20.3	45,704	10,795	34,909	3,031	-406	28,154	10,225	9,668	10,112	-55,534	71,000	4,118	5.8	71	9
1792	18,788	69,085	21.4	55,835	8,016	47,819	2,363	-919	56,494	-	9,643	-	-64,693	71,000	17,750	25.0	71	9

Sources: S.R.O. DD/DN, Bundles 238, 240, 241, 242, 243, 247, 253, 255, 256, 259, 264.
B.A.O. 28048, P/83/7, P/83/9.

NOTES: A The Bristol Brass Wire and Copper Company before its sale in 1787.
B The winding up of the old joint stock company.
C The establishment of the new partnership, the Harford and Bristol Brass Company.

For both companies balance sheets were drawn up to March 31st and presented to general meetings at the end of June.

Figure 2: Balance Sheet of the Harfords & Bristol Brass & Copper Company, 31 March 1789

Balance sheets for the years 1789 to 1792 and notes on manufacturing costs have been found amongst the papers of John Scandrett Harford (1754-1815), son of Edward Harford (1720-1806), BAO, 28048. The numbers are written in a cipher, and as no explanation of the code accompanies the documents, the following key has been devised by trial and error.

0	1	2	3	4	5	6	7	8	9	ditto (to repeat number preceding)
0	1	2	3	4	5	6	7	8	9	ditto

The evidence analysed in Table 8(9) shows how this capital re-formation was achieved. Part A dealing with the joint stock company has been mentioned. Part B covers the running down of its circulating capital, settlement of trade debts, and payment of compensation to shareholders. Part C shows the structure and organization of the new venture. This analysis suggests that the recipe for success involved replacing the cumbersome joint stock company with its large body of share-holders and dead weight of slow-moving stocks and stores, by a small partnership employing its more limited resources in a profitable relationship between fixed and circulating assets, and able to raise funds from external sources to supplement its own capital.

In 1779 there were 93 shareholders in the old company holding 790 shares. Both then dwindled, for the Bristol Committee felt obliged to buy unpurchased shares put up for sale, adding these to the Honorary or Maiden ones on which no dividend was paid. The grand total was 1,200. The joint stock varied from £140,000 to £160,000. The Bristol Committee managed the company, but there was a similar body in London, lobbying and negotiating there⁵⁵. Although not a monopoly, the size of this joint stock company and the dispersal of its resources on many sites might have led it to be faulted for showing some of the worst features of the exclusive bodies that were so criticised by the Bristol clergyman Dean Tucker in this period⁵⁶. Yet it was not the large number of shareholders who wanted to be rid of poor managers, but the small managing committee who wished to slough

off the bigger body, even though that meant losing the large joint stock and the privilege of transferable shares. In Feb. 1787 the company's buildings were put up for auction⁵⁷.

Who were the shareholders the Bristol Committee were anxious to jettison? By the 1780s many were far distant from the original sources of capital, though their names provide information about those earlier investors. The women in particular, forming at this time 28 per cent of those listed and holding 15 per cent of the shares, can often be identified with the earlier merchant investors. Elizabeth Parkin for example, daughter of the Bristol iron merchant John Parkin, had inherited 18 shares from him as well as her 1/6 share in the Woolley Powder Works. In 1779 the former were held by her executors but by 1782 they had become the property of her nephew Matthew Worgan, managing partner at Woolley, adding to the two Brass Co. shares he already held. A similar family network is seen in the case of Elizabeth Noble whose shares were inherited from John Noble I, a Newfoundland trader and supplier of brimstone to Woolley, whose son and grandson also held shares in the Brass Co. Shares were also conveyed by marriage, those of Martha Farrell for example becoming listed in 1783 under her married name of Eaton. Both Joseph Farrell and Thomas Eaton, progenitors of the now united families, were in the 1755 List of Traders to Africa. Indeed in 1779, 14 per cent of persons, holding 17 per cent of the stock, can be associated with the List, suggesting that given the dilution

over time, a significant part of the earlier capital must have come from this source.

Henry Tongue combined many of the most important features of the shareholders. He was based in Bristol, a merchant who had engaged in the Africa trade, undertaking at least five slaving voyages in the mid-eighteenth century. He was named in the 1755 List. His 64 shares formed the largest single holding, but such concentrations were not rare, for groups of 20 shares or more made up about one-third of the total and were held by 7.5 per cent of shareholders; groups of 10 to 19 formed another third and were held by 20.4 per cent; and groups of less than 10 formed the last third, held by 72.1 per cent. And by the end of the 1780s Henry Tongue was dead, a condition affecting nearly one-quarter of those named in lists of shareholders in that decade. The frustration of carrying a large number of family and executor shareholders, without the stimulus provided by the original entrepreneurs, may have been what finally influenced the Harfords to act as they did, especially as they were in contrast very active on behalf of the company. By the 1780s eight of them held nearly one-quarter of the shares, most notably Mark Harford, a linen and spelter merchant, with 50.

Shareholders not in the confidence of the Bristol Committee like Ezekiel Dickinson and his nephew William (M.P. for Rye and later for the county of Somerset) were perplexed by the coming sale. After commenting on their business in Jamaica, '..we cant

expect in this swampy soil to keep up our Number of Slaves...', the former went on in a letter of 1787 to question the motives of their colleagues, for 'Tis beyond my Comprehension - what our Committee in Bristol have in view by buying up...'. They consulted the balance sheets, but to no great effect, Ezekiel remarking that they were 'very much in the dark respecting the value of the dead and quick Stock..' ⁵⁸. In February 1787 the fixed capital of the old company was purchased by a partnership of ten, of whom seven were on the Bristol Committee and six were Harfords ⁵⁹. Even in this new form and under the leadership of the Quaker Harfords the association with wealth generated by the Africa and plantation trades continued, for of the non-family partners, Captain Walker had been a ship's master in the slave trade and John Fisher Weare was a sugar merchant. The £16,000 paid for buildings and equipment was a fair price according to the valuation of fixed capital in Table 8(9)A. But the morality of the manoeuvre was questioned. A Bristol correspondent told William Dickinson, '..with respect to the B W Comte their shameful Conduct relating to the sale of the Works is severely and deservedly censured by all ranks of People here' ⁶⁰.

Over the next three years the remaining stocks and stores were bought by the partnership, on such good terms that by July 1790 even poorer goods 'as must in part be remelted' had been purchased. Outstanding debts were also collected in, so that by June 1792 the old company's affairs had been 'redused into a

very small Compass'. As assets were realized, the sum of £306 per share was paid to remaining shareholders in 13 instalments. This was in excess of market value at the time of the take-over but given the overlap of membership it was a safeguard for the interests of old shareholders and new partners alike⁶¹.

The streamlined partnership which emerged is shown in Part C of the table. Column II shows the trimmed-down circulating capital. Not only was the fixed capital now a greater part of the whole, column III, but a smaller total capital was employed and that more productively because less of it was bound up in stocks and stores. Column V shows that the partners were less indebted to others in the trade than the old company had been, again implying a reduction of liabilities. But the most significant change was in the financial balance of column XIII. Drawing on a large joint stock, the old company had needed to raise few loans and the borrowings in column XII of Part A were for all except one year of those shown, more than offset by the reserve fund of £5,000, plus deposits with their bankers (Harfords & Co.) and holdings of Navy Bills. The new company however was based on the partner's capital of £71,000, less than half that of the former concern, so the success of the restructuring depended on their ability to raise supplementary funds. Their achievement is shown in the four columns grouped under 'Financial Liabilities' in Part C. In the first years funds were raised most substantially from the Bristol Fire Office⁶², these ceasing as loans from partners, executors, and

trustees grew in importance. Loans from Thomas Deane, included in column X of Part C, deserve a special mention. This Bristol merchant and shipowner had engaged in privateering in the 1740s, and in the Africa trade from 1746 until at least 1764, being involved in 32 slave voyages in that time, and appearing in the 1755 List. He became a partner in the Littleton Powder Works in 1753 and in the newly formed Harfords Bank in 1760, continuing with both until his death in 1798 aged 81.

The stages by which capital was raised from the partners are revealed in the ledgers of Edward Harford, established in business by his father in 1748 with the sum of £4,000. He had become a founding partner in the Harford Bank in 1760, and by the early 1780s his flourishing interests included 32 shares in the Brass Co. Over the two years from the beginning of 1787 his investment in the new brass partnership was built up by instalments to £10,000, made up of 10 shares of £1,000 each, with interest at 5.0 per cent. Then in 1790 and 1791 he made long-term loans of another £10,000, this time at 4.5 per cent. In 1792 the pattern evolved further with 5 short-term loans at 4.5 per cent concerning £7,500 in all, and averaging 2.4 months each. 1794 is the last year for which this evidence has been collected from the ledgers, but by May the short-term loans at 4.5 per cent already amounted to more than £3,000, plus one at 5.0 per cent of £457 for 94 days⁶³. These large loans made by Edward Harford privately, and not through his bank as the ledgers show, together with those made by other partners and by

Thomas Deane, suggest that this outlet for their surplus funds may have provided a further incentive for the take-over of the old company.

But even this attraction would not have been enough to persuade the partners to place their reputations and finances at risk. They are likely only to have entered upon this restructuring because of their perception that a new framework would allow the company's potential to be realized. Viewed in this way the soundness of the move is confirmed by the evidence in columns XV to XVIII of Part C, which show net profits and their distribution amongst nine partners rather than tenfold that number of shareholders. The rates of return were even higher than here indicated, for in contrast to the joint stock company the cost of the partners' capital was paid separately at the rate of 5 per cent as the Harford ledgers confirm. The overall return in these four years was thus between 10 and 30 per cent, a financial reward so much greater than that paid to the shareholders of the old company, that it must have been seen to justify the manoeuvres of 1787. In the following years the rate of return (interest plus profit) was 21.5 per cent in 1793, 8.0 per cent in 1794, and 12.5 per cent in 1795⁶⁴, as wartime needs off-set the decline of other trades especially that in slaves. It is an irony of Bristol life that a Quaker family such as the Harfords, of whom Edward became in 1789 the chairman of the first provincial committee against slavery⁶⁵, should have been closely connected to the trade they abhorred,

through the use of some of their products for barter, and the financing in part of their businesses by profits made through the trade in slaves or their labour.

There is some evidence that the new company was not seen simply as an investment opportunity, for contemporary with the balance sheets of 1789-92 are documents on manufacturing techniques which like them have had to be decoded. They give details of the production of ingots, brass plates, battery, and wire, but the emphasis on 'savings made'⁶⁶ suggests the cost-minimizing noted in the Percival & Copper Co. rather than the innovatory approach needed to overcome the competition faced. But in the meantime the partners had revived the fortunes of the firm. Although it can be argued this was a matter of capital re-formation rather than formation it can also be claimed that as the greatly improved returns to capital show, this was not simply the same company with a new name but a different firm with newly productive assets.

iv Conclusions

The evidence investigated has concerned enterprises that were outposts of Bristol's trading network, located in north Somerset because of the accessibility of water-powered sites. They were dependent on the port of Bristol for the handling of raw materials and finished goods, and on the merchants of that city for investment capital, loans, and credit. There was thus

a close integration at several levels between merchanting and manufacturing in the region, which is less evident in indigenous industries such as woollen textiles and brewing. These have not in any case been studied in comparable depth because evidence of a similar continuity has not been available for such concerns. Although geographical factors were critical in determining location, the familiarity of many Bristol merchants with the county must have influenced their readiness to invest in these rural sites. The Dickinson family for example strengthened their links with the region by the purchase of land at Congresbury, and Queen Charlton near Bath, as well as their main estate at Kingweston. Other successful merchant families like the Parkins and the Eltons leased out land they had already purchased to manufacturing partnerships of which they may or may not have been members.

To the suitability of sites and familiarity with the region must be added another reason for investment in manufacturing, the expectation of future returns. The evidence which has been analysed suggests the possibility, however unsatisfactory, of maintaining a distinction between the capital invested by the partners and that employed productively, and so on the basis of the contemporary evaluation of assets two questions will be now be discussed - the financial returns to the partners' capital, and the profitability of the physical capital employed.

Contemporary practice with regard to the former has been criticised by Pollard on the grounds that an arrangement whereby interest is seen as a return to capital and profit a reward for risk and innovation is heretical, because it treats capital as 'an auxilliary to entrepreneurship instead of the central motive force behind the firms'⁶⁷. Quite apart from the practical point that the Usury Laws drew attention to the cost of capital and made it reasonable to provide a distinct allowance for it, the view of interest as the cost of retaining capital in some use is in accord with economic theory and not heretical at all. Profits in the economist's sense are what is left when all costs, including interest, are balanced against business earnings. It would be a more fundamental criticism of contemporary practice to suggest that where the cost of capital was treated as neither an item to be met before the dividend was declared nor as part of it, a trading loss could be hidden as with the old Bristol Brass firm. In the case of this joint stock company however the possibility of capital gains through the transfer of shares may have overcome the usual view that dividends should comprise interest plus profits. It may of course be argued that if partners were prepared to regard their investment capital as an equity holding there is no reason why it should receive a fixed rate of interest, but this would be to assume an attitude towards capital holdings not borne out by the historical evidence.

Table 8(10) records the attempt that has been made to compare the returns to partners' capital in various ventures. The lowest were to the joint stock holders in the Bristol Brass Co. at about 5.0 per cent. Of the three partnerships, returns to the Percival & Copper Co. partners were nearly 10.0 per cent in the 1760s. Those at the Woolley works were lowest in the 1740s at 11.0 per cent and highest in the 1790s at nearly 24.0 per cent, when partners in the re-formed Harford and Bristol Brass Co. were receiving an average of 16.7 per cent. These returns were not too different from those in banking, for Edward Harford received from 20.0 to 25.0 per cent on the £2,000 invested thus in the 1780s and 90s. On a fixed interest loan to the bank rising to £18,000 he received 4.5 per cent from the early 1780s to at least 1793⁶⁸.

Secondly, although there is no evidence that the partners considered the question of the profitability of the capital employed, they must have had some notion of this if only to persuade themselves when it should be increased. But its modern measure as the ratio of net trading income to net capital employed requires some modification in the light of historic circumstances, especially as there is no firm evidence in eighteenth century documents of a depreciation allowance for fixed capital assets. Profitability is therefore defined for present purposes as the ratio between gross trading profits (the balance between the revenue from sales and the costs of production, derived from the dividend minus cost of partners'

capital and without the label 'income' as the physical assets were used only for production) and the gross capital employed (fixed assets, stocks and stores). Comparisons are hazardous, especially with uncertainties about the valuation of fixed assets, but the findings are summarized in Table 8(11).

At the Woolley Works the profitability of the capital employed in those years for which there is a reasonable certainty of the value of the circulating capital as narrowly defined, was greatest in wartime - the 1740s, the second half of the 1750s (when the average was nearly 15.0 per cent), and the 1790s. Despite the low rate in the early 1750s, investment in fixed capital was not postponed by the partners, but they chose to borrow at 4.0 to 5.0 per cent rather than increase their own commitment. In 1798 wartime profits were high enough to counteract the effect of the stock appreciation associated with inflation on the rate of profitability. By then the partners had already decided they were overprovided with productive capacity, and had embarked on the consolidation with the Littleton Works which was to cut the combined assets by a half. The rate of return in 1798 of 27.3 per cent on capital employed and 29.5 per cent on that invested by the partners, probably helped delay this move until 1803.

With few figures for the physical assets of the Percival & Copper Co., estimates of profitability are very tentative. For the 1760s, figures for circulating capital have been

Table 8(10): Summary of Average Annual Returns (profit plus interest) to Partners' or Shareholders' Capital, 1746-1809

Years	Woolley Powder Works %	Joseph Percival and Copper Co. %	Bristol Brass Wire and Copper Co. %	Harford and Bristol Brass Co. %	Harfords Bank %
1746-49	10.95 (4)		5.29 (2)		
1750-59	13.98 (8)		4.82 (9)		
1760-69	11.14 (7)	9.77 (7)	5.05 (8)		10.57 (1)
1770-79	13.42 (5)		4.80 (1)		
1780-89	13.60 (4)		a) 4.47 (8) b) 5.30 (3)	20.20 (1)	21.67 (10)
1790-99	23.73 (9)			16.71 (6)	25.53 (4)
1800-09	15.38 (8)				

Sources: See Tables 8(1), 8(7), 8(8), 8(9) and *text*.

NOTES: 1 Brackets indicate the number of cases studied.
2 For the years 1780-89, a) relates the return to the stockholder's valuation of his holding, whilst b) relates it to the general joint stock.

Table 8(11): Profitability of Capital Employed in Industrial Enterprises in North Somerset, 1746-1799

Years	Woolley Powder Works %	Joseph Percival and Copper Co. %	Bristol Brass Wire and Copper Co. %	Harford and Bristol Brass Co. %
1746-49	12.76 (3)			
1750-59	6.85 (6)			
1760-69		3.80 (7)		
1770-79			-0.21 (1)	
1780-89			0.37 (3)	14.35 (1)
1790-99	27.28 (1)			12.24 (3)

Sources: Tables 8(1), 8(2), 8(3), 8(7), 8(8) and 8(9).

NOTE: Brackets indicate the number of cases studies.

estimated from the Metal Account, and those for fixed capital have been reached by relating the number of mills, furnaces, and calciners of this company to those of the old Brass Co.. In a year of low estimated profitability and so of inefficiency in the use of physical assets like 1766, stores of copper ore were three times higher than for other years in the decade, but the same relationship does not hold good for the other year of low returns, 1764, nor is the converse true for a year of high returns, 1765. Therefore although the size and value of stocks and stores was an important factor in the productive use of capital, the external influences governing trade generally were also clearly influential.

The least profitable use of capital in the limited examples available concerns the old Bristol Brass Co., whose poor rates of return reflected both the large stockpiles of raw materials and finished goods, and the fact that a deduction from the dividend of the cost of the partners' capital rendered the profit negligible. The figures for the newly formed Harford & Bristol Brass Co. in contrast, provide clear evidence that the re-formation made economic as well as financial sense. The sloughing off of the cumbersome stocks and stores of the old by the new company, made for a more efficient and profitable use of the capital employed.

Although these estimations cannot provide a precise measure of profitability, they do suggest that the rates of return were

highest where there was a specific effort to make a more efficient use of assets (the Harford & Bristol Brass Co.), or when market conditions were exceptionally favourable (the Woolley Works), and lowest when either the form of legal organization and asset relationship (the Bristol Brass Wire & Copper Co.), or the dispersed physical structure of the firm (Joseph Percival & Copper Co.), led to inefficiency in the employment of capital. In general these conditions were also reflected in the returns to the partners' investment, although as the evidence from Woolley shows, a high level of financial reward did not necessarily lead to that investment in new fixed assets which may have further increased the profitability of the firm by allowing for the introduction of technological change and diversification in an otherwise static industry.

Supplementary information on merchants in the text comes from documents relating to their business interests, or works by the following authors listed in the bibliography: Cave, Latimer, McGrath, Minchinton, Richardson. The '1755 List of the Company of Merchants trading to Africa from Bristol' is from Richardson, 'Bristol Slave Trade in the Eighteenth Century'.

1 Robin Atthill 'Industry' in Atthill ed., Mendip: A New Study (Newton Abbot, 1976), pp. 145-79; also his Old Mendip (Newton Abbot, 1964), pp. 55-94; Down & Warrington, Somerset Coalfield, pp. 87-9.

2 Billingsley, Agriculture of Somerset, pp. 68-72, 110-115; Walker, Bristol Region, pp. 169-176, 206-211; V.C.H. Somerset, II, p. 354.

3 A Brief Deduction, p. 6, quoted in V.C.H. Somerset, II, p. 416; Defoe, Tour Through England and Wales, p. 280.

4 Atthill, Old Mendip, pp. 55-67; See also the survey of paper mills, BIAS Jnl., III (1970), pp. 11-21.

5 SRO, Hylton of Ammerdown MSS Box 36. 'Live and Dead Stock Returns, Frome Division', 1803.

6 SRO, DD/FS Box 27. In particular 'An assignment of a Leasehold Estate called Saunders' at Dullcott in St. Cuthbert's parish, Wells, Somerset for securing £1900 and Interest', 1767.

7 B.J. Greenhill, 'Nailsea Glass Works', BIAS Jnl., IV (1971), pp. 26-7; R.A. Buchanan & Neil Cossons, Industrial Archaeology of the Bristol Region (Newton Abbot, 1969), pp. 145-8; Thomas, 'Agriculture and Industry in Nailsea', pp. 78-88.

8 Buchanan & Tucker, 'The Manufacture of Gunpowder', Ind. Arch. Rev., V (1981), pp. 185-202.

9 SRO, Strachey MSS, DD/SH Box 27. Unless stated otherwise the Strachey papers referred to are in this box.

10 Pollard, 'Fixed Capital in the Industrial Revolution', in Crouzet ed., Capital Formation, pp. 147-51. The findings refer to isolated years for different firms, and with the fluctuations in stocks and stores may not represent typical relationships.

11 A 'Memorandum relating to Gunpowder Works' of 1747/9 (both dates appear on the paper) to Henry Strachey, notes the 'best powder' was made from 64 or 70 lb of saltpetre, 18 lb of brimstone, and 18 lb charcoal.

12 A letter from Henry Strachey in London to Edmund Baugh, managing partner in Bristol, 15 Dec. 1761, reported the view of Sir Charles Frederick of the Board, that the defect in their powder was '...most likely owing to want of refining the petre well of its Sea Salts and other Dross, or want of well drying after it is refined, to want of refining the Sulphur, or an undue

proportion of the Ingredients'. For a full account of the process of manufacture at Woolley see the reference in n.8.

13 Letter from George Dyer in Bristol to Henry Strachey, March 29 1799. On outside, 'Taxable Powder Income of 1798 - £901.2.4.'.

14 L.B.Gower, Modern Company Law (1979), p.215, gives an accountancy definition of circulating capital as those assets turned over in the course of the company's business, namely its money, trade creditors, and stock in trade.

15 Pollard, 'Fixed Capital' in Crouzet ed., Capital Formation, p.153.

16 SR0, DD/SH. Bundle 132 contains correspondence reciting the titles to land in Clifton, Bristol, from 1728; that in Bundles 261-3 refers to the building boom there of the 1790s.

17 Letter from Henry Strachey yr. to his father, 20 July 1762. The former benefitted from the patronage of Lord Clive whom he accompanied to India in 1764, returning three years later with a fortune of £18,000. His first seat in Parliament was in Clive's Shropshire stronghold. He became a baronet in 1801, C.R. Sanders, The Strachey Family 1588-1932 (Duke U.P., 1953).

18 Minchinton, Politics and Port of Bristol, p.191.

19 Minchinton, Trade of Bristol, p.173, quoting BM Add MSS 38416 fo.208.

20 In a letter to Sir Henry of 12 June 1805, George Dyer agreed there was 'Every appearance of one of the best Establishments in the Country being destroyed by the miserable avarice of one or two of the Partners'.

21 Letter from Henry Strachey to Mr. Dyer, 23 August 1799; and from the surviving partners to Sir John Benn Walsh Bt., Warfield, nr. Bracknell, Berks., 15 January 1811.

22 Pollard, 'Capital Accounting' in Crouzet ed., Capital Formation, p.131.

23 The calculations were based on information conveyed by letter from Mr. Dyer, 12 June 1798.

/ 24 Letters from Mr. Dyer in Bristol to Henry Strachey, with the balance sheets and dated 27 Nov. 1795, 23 Nov. 1796 & 30 Nov. 1797.

25 Letter to Mr Baugh in Bristol from Henry Strachey yr. in London, 1 January, 1762, reporting on negotiations with the Board of Ordnance.

26 John Beaumont, 'On a New Way of Cleaving Rocks', Phil. Trans. Roy. Soc., XV, 167 (1684/5), p.854; Strachey, 'Coal-Mines of Mendip', op.cit., XXX, no.360 (1719), p.968.

- 27 Pollard, The Genesis of Modern Management (1965), p.81; Griffin, Coalmining, p.48.
- 28 Letter from George Dyer, Bristol, to Sir Henry Strachey, London, 20 July 1804; The first Cornish powder mill was not built till 1809, Bryan Earle, Cornish Explosives (Penzance, 1978), pp.28-9.
- 29 Rough draft by Henry Strachey of an application to Sir Charles Frederick at the Board of Ordnance, 14 May, 1762.
- 30 In a letter to Mr. Baugh in Bristol, 28 June 1762, Henry Strachey yr. criticises these restrictions.
- 31 Minchinton, Trade of Bristol, pp.ix-xii.
- 32 Latimer, Annals of Bristol, II, pp.74, 249, 267-8, 320-1, 338, 351, 436.
- 33 Letter from George Dyer in Bristol to Henry Strachey in London, 27 November 1795, 'We have lost our Africa trade...'.
- 34 Letter from George Dyer in Bristol to Sir Henry Strachey in London, 8 June 1803, with a 'Copy of the Resolution of the Littleton and Woolley Gunpowder Works for Consolidation, 7 June 1803'.
- 35 A.H. John, 'War and the English Economy, 1700-1763', Econ. Hist. Rev., VII (1954-5), p.331; Joan Day, Bristol Brass (Newton Abbot, 1973), pp.26-7; Pollard, Modern Management, p.102.
- 36 Day, Bristol Brass, pp.56-7, and 'The Costers: Copper Smelters and Manufacturers', Trans. Newc. Soc., 47 (1974-6), pp.47-58.
- 37 John, South Wales, pp.7, 28-9.
- 38 Latimer, Annals of Bristol, II, p.239; Minchinton, Politics and Port of Bristol, pp.63-9.
- 39 Latimer, Annals of Bristol, II, pp.142-6; Minchinton, Trade of Bristol, pp.xvii-xviii.
- 40 BRL, B4771. 'The Committee Book containing the Minutes and Orders of the Partners concern'd in the Copper Trade carried on in the City of Bristol in the Name of Joseph Percival and Copper Company', 1762-69'. 3 September 1764.
- 41 BRL, B4771, 2 Sept. 1762, 22 Nov. 1764; BAO, 12171(1), 'Account and Memoranda Book of the White Rock Copper Refinery, Llansamlet', 1749-98, pp.46-50, hereafter the Metal Account Book.
- 42 Pollard, 'Fixed Capital' in Crouzet ~~ed.~~, Capital Formation, p.150, Table I, where circulating capital ranges from £6,700 to £43,000.

43 Day, Bristol Brass, pp.78,90-1.

44 BRL, B4771, 9 June, 24 August, 27 October 1768.

45 BRL, B4771, 6 December 1762.

46 BAO, 1217(1), Metal Account Book, p.50.

47 Pressnell, Country Banking, pp.323-332; John, South Wales, pp.23-57, 116-7.

48 BRL, B4771, 3 September 1764. James Bannister purchased two shares at £1,000, on which he was to receive 'Interest for the same at the rate of 5 per cent from July 1st inclusive'. This sugar baker, shipowner and privateer was engaged in the slave trade in the 1750s, and figured in the 1755 List.

49 BRL, B4771, 27 January 1766.

50 SRO, Dickinson MSS, DD/DN; BAO, Harford MSS, 28048. See Figure 2.

51 The history of the company in the following two pages is drawn largely from the account given by Day, Bristol Brass.

52 SRO, DD/DN, 405, Ledger A, 28 Jan.1747, 15 Feb.1750; 406, Jnl.B, May 1759; 408, Jnl.C, Jan.1771; BAO, 28048, Ledger F1/1, 31 March 1748, 17 May 1756, 31 Dec.1768, 4 Nov.1765, 7 May 1768; Jnl.F5, Jan.1780, Jan.1781; Ledger 2/1, Jan.1781. Also letters, SRO, DD/DN, for example Bundle 241, from James Whitchurch in London to William Dickinson at Kingweston, 1782, referring to purchases at £230 thought to be by 'sr Jarrett and Co', presumably Sir Jarrit Smith of Ashton Court who already held 10 shares; Bundle 247, from Ezekiel Dickinson of Bowden House, Wilts. to his nephew William, about his son Barnard's sale of shares, 18 Dec.1786.

53 SRO, DD/DN, Bundle 240, Letters from Edward Shiercliff, Bristol, to William Dickinson, 20 Sept., 13 & 18 Oct.1781; See also, Minchinton, Trade of Bristol, pp.x-xi and Apps. A,D,E,F,G.

54 SRO, DD/DN, Bundle 238, 'Minutes of the General Meeting of the B W & Copper Compy Bristol, 28 June 1779'; also in Bundle 241 for 24 June 1782, Bundle 242 for 30 June 1783, and Bundle 243 for 28 June 1784.

55 SRO, DD/DN, Bundle 238. The Mins.of Gen.Meeting of 28 June 1799 recorded the following elections: The Bristol Committee, Sir Jarrit Smith, Edward Harford sr., Mark Harford sr., Edward Harford yr., William Battersby, Mark Harford yr., Joseph Harford, George Champion, Dr.Abraham Ludlow; The London Committee: James Whitchurch, Ezekiel Dickinson, Lough Carleton, William Dickinson, Bibye Lake, Sir James Winter Lake, Barnard Dickinson.

56 George Shelton, Dean Tucker and Eighteenth Century Economic and Political Thought (1981), for example pp.62-4.

57 BAO, 28048, Jnl. F6/1, 26 Feb.1787.

58 SRO, DD/DN, Bundles 246 & 247, letters from Ezekiel Dickinson at Bowden House to William Dickinson, 14 April & 18 Dec.1786.

59 BAO, 28048, Jnl. F6/1. In March 1787 the new partners were listed as: William Battersby, Joseph Harford, John Fisher Weare, John Scandrett Harford, Dr. Abraham Ludlow, Captain Thomas Walker, Charles Edward Harford, Charles Joseph Harford, Edward Harford, and Mark Harford. However Mark Harford died soon afterwards and the number of effective partners was nine.

60 SRO, DD/DN, Bundle 251, letter from Edward Shiercliff in Bristol to William Dickinson, 8 April, 1787.

61 SRO, DD/DN, Mins. of General Meetings: Bundle 253, 30 June 1788; Bundle 259, 28 June 1790; Bundle 264, 25 June 1792. The stages by which the 'dividend' of £306 was paid are recorded in Edward Harford's Jnl., BAO, 28048, F6/1, and William Dickinson's correspondence, SRO, DD/DN, Bundles 253, 255, 256, 259, 264.

62 Latimer, Annals of Bristol, II, p.393, records that in 1790 the New Bristol Fire Office was re-named the Bristol Fire Office, and its capital increased to £240,000 from the £108,000 with which it had been founded in 1770. Edward Harford's Jnl., BAO, 28048, F6/1, shows he had 4 shares in the company at £270 each.

63 BAO, 28048, Jnl. F6/1. Investments in partnership totalling £10,000 were made on 26 Feb., 1 March, 2 July, 2 Aug., 29 Sept. 20 Dec.1787; 11 Feb., 28 July, 18 Sept., 10 Nov.1788; and 26 Jan. 1789. Long-term loans were made on 26 Nov.1790 & 25 July 1791. Short term loans were made on 31 March, 4 June, 12 July, 2 Aug., 13 Sept.1792 (entered April 1793), 31 March and May 1794.

64 Ibid., Oct.1793 (but due 31 March), May 1794, June 1795.

65 Latimer, Annals of Bristol, II, p.476.

66 BAO, 28048. For example P83/(5), 'Accot of Melters Pots used at Bapt Mills In 26 Years as Under and the Savings made...'; and P83/(10), 'Notes of cost incurred in smelting copper'.

67 Pollard, 'Capital Accounting' in Crouzet ed., Capital Formation, p.126.

68 BAO, 28048, F2/1, F5, F6/1, Ledgers and Journals of Edward Harford.

Chapter 9 Capital Investment in Transport

Investment in transport in this region was so closely associated with the developments in agriculture, mining, and manufacturing already described, that it is difficult to determine the extent to which it was a stimulus or a response to these changes. It may therefore be judicious to see it as part of the general development of the regional economy, based on both the need to carry goods and people more rapidly and conveniently, and the availability of surplus funds arising from the profits being made. The timing and location of these developments must also be taken into account. It is notable that the first roads to be turnpiked in the early decades of the eighteenth century were those serving the woollen textile centre and popular spa of Bath and the growing port of Bristol, and that the improvement of the River Avon from the 1720s allowed waterborne transport between the two¹. But the growing importance of the regional economy, in addition to that of the port and resort, is made clear by the network of transport facilities which developed in north Somerset from the mid-eighteenth century.

In support of this view reference may be made to the founding of the Wells and the Shepton Mallet Trusts in 1753, the Frome Trust in 1757, the Buckland Dinham Trust in 1768, and the Harptree Trust in 1793. On the fringes of the region with some roads entering it were the Warminster and Frome (Black Dog)

Trust of 1752 and the Bruton Trust of 1756². This activity was enhanced by the increasing vigour of the Bath and Bristol Trusts as the former's renewal Act of 1756/7 removed its administration from the county justices and handed it to local trustees (often business men and professionals with a stake in the improvement of the roads), and the latter's amendment Act of 1748/9 reduced the opposition of colliers and farmers³. All this led to the growth of a road system that was one of the densest in England in the second half of the eighteenth century, and of which Billingsley was able to claim in the mid-1790s, 'Publick roads pretty good, considering the traffick upon them'⁴. Much of this traffic was of national significance as passengers, post, and goods were carried between London and Bath and other provincial centres like Exeter, but the importance of bulky local goods such as grain, coal, and stone should not be under-estimated as they were vital to the region.

Most of these improved roads were in the two-thirds of the region east of the Bristol Trust's road to Bridgwater (now the A38), and the Mendip enclosures which began in the 1770s were undertaken subsequent to the work on most of them. In contrast the water-logged lands of the western third were badly served by turnpikes until the drainage schemes of the early nineteenth century had by their control of flooding made possible a more intensive agricultural use of the land. The Wedmore Trust was founded in 1827 to serve the hitherto isolated area between the River Axe and the Bridgwater road near Shipham. But there was a

continuing lack of good roads in the coastal area of north Somerset. The Bristol Trust road through Long Ashton authorized in 1749 petered out in the parish of Yatton, and that to Portishead through Abbots Leigh authorized in 1779 was not constructed beyond the bridge at Pill, a creek on the estuary of the Avon and home to many Bristol Channel pilots⁵. Coastal trade provided little compensation for this neglect. Some grain and cider was sent to Bristol from the fishing village of Portishead, but further south the rocks at Clevedon and sandy muds at Weston-super-Mare deprived the coast of good harbours until the small port of Uphill is reached at the mouth of the River Axe, the southern limit of our region and of the jurisdiction of the Collector of Customs at Bristol. But this ancient harbour from which Mendip lead was reputedly shipped in Roman times, and whose wharf was secured for trade by the enclosure award of 1818, was more important for the import of coal and cattle from South Wales, than for the transport of goods within the region⁶.

After the improvement of the River Avon in the 1720s there were no comparable schemes until the 1790s when three were launched, for the Kennet and Avon, the Somerset Coal, and the Dorset and Somerset Canals⁷. Investment in waterborne facilities will now be examined briefly before attention is focussed on the sources of capital and its investment by the Bath Turnpike Trust.

i Capital Investment in River Navigation and Canals

The River Avon was made navigable before the period covered by this research, but its financing is worthy of some consideration because of the continuing importance of the Navigation. Efforts to improve the river had been made since the beginning of the seventeenth century, at the end of which the issue was renewed by the Mayor and Corporation of Bath. In 1712 they secured an Act which allowed them to make the river passable from Bath to 'the Hannams-Mills and Wear' above Bristol. The preamble said this would promote the transport of 'Persons of Quality' to Bath and the 'Carriage of Freestone, Wood, Timber, and other Goods', as well as aiding the poor through the benefits to trade. But the poor were not grateful, fearing this breach of their little monopolies. As late as 1738 a mob of Kingswood colliers demolished the lock at Saltford because of the Shropshire coal being brought into Bath. Farmers, maltsters, and road carriers were also afraid of competition, millowners were apprehensive of the effect on water-power, and those dependent on the resort thought the ensuing 'great Concourse of People' would be detrimental to health. This continuing opposition, and the unwillingness of riverside landowners to part with property, delayed work for another 13 years. The improvements were eventually undertaken by a private body of 32 proprietors made up largely of Bristol merchants, Bath business and professional men, and country

gentlemen, which gives a foretaste of the way economic change was to be achieved in this region⁸.

The Bristol group was led by John Hobbs, a timber merchant with an eye to the housebuilding market in Bath, who contracted to provide timber for the locks in 1725. It included: two copper manufacturers, Robert Coster of the company already discussed, and Dr John Lane a lawyer with works at Swansea; John Hickes an African trader; Thomas Tyndall an haberdasher and shipowner; and James Hardwick who negotiated with river-side landowners and may have been an attorney. On Hobbs' death in 1735 his share was taken over by Joseph Jones, another timber merchant, who later worked for the Woolley partners. The Bath interest included members of Parliament, General Wade and John Codrington, and professionals like Dr Charles Bave, but it was dominated by Ralph Allen, an increasingly successful entrepreneur⁹. In 1720 he had gained control of all mail by-passing London for an annual fee of £6,000. To this profitable business must be added stone quarries whose market stood to be extended beyond Bath by the improved navigability of the Avon. Shares were initially limited to one per proprietor, but Allen overcame this restriction by a move not previously remarked on. He enrolled his wife Elizabeth, mother Gertrude, nephew Philip, sister-in-law Sarah Hudson, and brothers-in-law Anthony Rodney Buckeridge and Charles Holder. When the last-named withdrew, the share was taken over by Ralph's brother Philip, and on his mother's death her share went to his father¹⁰.

Ralph Allen was appointed senior treasurer, and it was agreed at the first meeting of the co-partners on 1 January 1725 that a newly-purchased iron chest be 'lodged in ye poste offis or in ye dwelling hous of Mr Ralph Allin as he Shall find moste Convenient'¹¹. The 'iron chest' deserves mention for it exemplifies the way finances were handled in this region for much of the eighteenth century. When the proprietors answered a call for funds in September 1725 for example, £420 was 'put in the Chest' as part of the sum of at least £12,000 which passed through Allen's hands in the first ten years of the venture¹². But his public spiritedness did not end there, for by the 1730s he was regarded by Bath Council as their banker, and in mid-century he played an important part in the raising of capital by the Bath Turnpike Trust. The image of Allen's private and public affairs being funded from many coffers is not fanciful, for the architect John Wood's fears about the financing of the great mansion of Prior Park planned in the mid-1730s, were said to have been lulled when 'Allen led him into the room where he kept his money and opened chest after chest full of guineas'. His biographer felt the story 'not a little improbable', but the evidence suggests the contrary¹³. In addition to the capital sum mentioned, Allen also had responsibility for revenue from the Navigation tolls, averaging over £700 per year in the 1730s¹⁴. The reward for handling such funds was the opportunity to put them to private use, and though there is no suggestion of malpractice by Ralph Allen, others had lower standards. Thus it was discovered in 1786 after the deaths of

joint treasurers Leonard Coward, linen draper, and Richard Attwood, plumber, that they had appropriated interest amounting to over £1,700 on the cash balance they held¹⁵.

This experience notwithstanding, tolls levied on users of the Navigation provided a steady source of income, above £1,000 per year in the second halves of the 1760s and 1780s and early 1790s. But although efficiently run the concern remained a local one, with the proprietors deaf to pleas for an extension towards London which surfaced intermittently, promoted especially by Bristol merchants. They had no success until the early 1790s, when perhaps due to the easier investment conditions of those years and the contagion of the 'canal mania', the Kennet and Avon, Somerset Coal, and Dorset and Somerset Canals were all promoted. It is of interest to this study of investment that in their promotion and execution these schemes were so different.

The promotion of the Kennet and Avon to ease transport between Bristol and London, was from late 1792 largely in the hands of merchants and capitalists of the former, who tried to monopolize the shares. Public opinion forced them to become more open, but it has been calculated that even then 80 per cent of subscriptions remained Bristol-based, boosted by the tradesmen there. This enthusiasm was part of the general speculative activity in Bristol at that time, which extended to building in Clifton as well as to some promotions which failed

to secure Parliamentary sanction, such as the Bristol and Western Canal for which there was so much zeal that in 1792 a meeting in Wells chaired by John Billingsley had to be kept secret as the subscription list was already full. Bristol's role in the Kennet and Avon lessened after the financial crisis of 1793, and as new shares were created the importance of Londoners grew in a project for which £950,000 had been raised by the time it opened in 1810¹⁶. As Bristolians grew wary of speculations so they also ceased to support ventures seen as offering primarily economic rather than financial rewards. Only 17 of the 171 proprietors of the Somerset Coal Canal authorized in 1794 came from that city, and only one of those of the Dorset and Somerset Canal authorized in 1796. But institutional support remained firm, and in 1797 the partners of the Exchange Bank, attorney Samuel Worrall and Thomas Blatchley, loaned £6,000 to the proprietors of the Kennet and Avon. When Harfords Bank became treasurers after 1801, an overdraft reaching £60,631 was maintained until 1816¹⁷.

The accessibility of the nearby Kingswood coalfield may have reduced Bristol interest in the Somerset Coal Canal, but it was the economic prospects which secured the support of others, especially the coal masters who were the main promoters of this scheme to engineer a link with the Kennet and Avon. An initial meeting was held in 1792 with Billingsley in the chair, and an Act was secured in 1794. He was joined on the committee of management by John and William Crang, Jacob Mogg, Samborne

Palmer, Richard Perkins, James Savage, James Tooker, and Francis Whalley. James Stephens, squire of Camerton and like the rest a coal master, became chairman. With this scheme there was a coming together of many strands: the attorneys were Richard Bowsher of Bath who was closely involved in building projects there, and Edmund Broderip of Wells who acted in the Axe and Congresbury Drainage and the Wookey and Wells Enclosures; the treasurers were the Old Bath Bank of Messrs Hobhouse, Clutterbuck, Phillott & Lowder who had very strong roots in the region; and the surveyors and engineers included John Rennie and William Smith who had worked on drainage and mining in north Somerset. The Act had authorized the raising of £80,000 plus a further £40,000 should this prove insufficient, but engineering problems meant that in 1802 authorization was sought for an additional £20,000, plus a separate, shared Lock Fund of £45,000. As their treasurers refused to advance any money on the security of the canal, the committee became indebted to Eleazer Pickwick, the wealthy proprietor of the White Hart Inn in Bath, who lent £10,000 on mortgage for five years, with further loans in that time of £11,000. He was made treasurer in a move reminiscent of the earlier dependence of the Avon Navigation on the support of a wealthy Bath entrepreneur. By the time the scheme was operating fully in 1815 expenditure totalled over £160,000, but the difficulty of establishing what proportion of this concerned capital investment is shown by the report of the chairman, 7 December 1799, that 'Aggregate expences' had then reached £76,000 from which

nearly £10,000 covering matters such as legislative costs and interest payments to subscribers had been deducted to leave 'the money actually expended in cutting and forming the Canal'. This sum however still included the cost of land, salaries, and committee expenses¹⁸.

By 1798 the completion of the first section of the canal to Dunkerton Wharf had already reduced the price of coal in Bath, and with the link to the Kennet and Avon Canal in 1805 a large part of south central England was opened up to Somerset coal. When finally completed in 1815 the arm to Radstock had become a tramway rather than a canal, but this did not detract from the success of the venture for the returns to that date averaged 10.0 per cent per annum, a figure very close to the projected rate of 11.25 per cent which may be calculated from notes found amongst the Company's early papers, relating to the tonnage produced, transport charges levied, and capital invested. The returns to the Kennet and Avon in the same years however averaged only an annual 2.5 per cent. The few Bristolians who had invested in the canals of the South Wales coalfield (chiefly Harfords because of their family business interests there) did much better, for both the Neath and the Swansea Canals produced average annual returns in the years to 1815 of 15.0 and 14.0 per cent respectively¹⁹.

In contrast the Dorset and Somerset Canal scheme to provide transport for the southern part of the coalfield was a failure.

Authorized in 1796, the branch built from the Nettlebridge collieries to Frome was only part of an over-ambitious scheme to link the Bristol and English Channels from the Kennet and Avon near Bradford, to Poole on the south coast. When projected in December 1792 there had been much support for a canal that could carry coal into Dorset in exchange for potter's clay for the Midlands. Richard Messiter the attorney and banker played a crucial role, supported by his three brothers and operating through his bank partnerships at Frome and Wincanton. The committee set up to secure the Act was a judicious mix of the landed interest, including the Earl of Ilchester who had experience of other canals; representatives of the gentry such as Harry Edgell of Standerwick, and of the clergy such as the Rev. Samuel Farewell of Wincanton, both of them justices; and practical improvers such as coalmasters John Billingsley and Samuel Kelson, both actively engaged in the promotion of other canals. The Act authorized a capital of £150,000 with reserve powers for £75,000 more, but in the changed circumstances of the later 1790s, only about £58,000 was actually raised. The largest shareholder, subscribing £8,500, was Richard Perkins, whilst Billingsley's share was £3,500. Both were brewers in Ashwick, but whilst the latter's roots were in the region, the former's connections were with Bristol, with distilling and the Africa trade. There were also minor shares, like that of Uriah Messiter, brother of Richard, for £300. When the Royal Assent was received in 1796 the brothers became clerks and treasurers. After preliminary surveys by Robert Whitworth, William Bennet

of Frome became the engineer, the two having worked together on the Axe Drainage. Engineering difficulties and shortage of funds caused problems in the early 1800s, at a time when attention was diverted by the war effort. Work was halted and never resumed as money remained tight and supporters died (John Billingsley in 1811), or became bankrupt (Richard Messiter in 1819)²⁰.

The isolation of the western third of the region has already been noted, as has the enthusiasm in 1792 for a Bristol and Western Canal to remedy this. But the project fizzled out in the course of the decade and not till 1810 was the idea revived as the Bristol and Taunton Canal. This brought to the surface the conflict of interests in this part of the region between the Commissioners of Sewers who feared for their drainage schemes, and the coal masters, glass makers, and farmers who welcomed the prospect of an easier distribution of their produce. A survey by William Smith confirmed that coal reserves were sufficient to make the scheme worthwhile and an Act was secured in 1811 which authorized a capital of £420,000 plus a contingency of £150,000. The proprietors were confident enough to purchase 20½ acres of land in the Nailsea enclosure of 1813-19 at a cost of £1,279. But the scheme foundered, despite the skills of their clerk Isaac Cooke of Bristol, an experienced canal promoter. Not till the opening of the Bristol and Exeter Railway in 1841 was this isolation banished and the development of the area, particularly its coastal resorts, made possible²¹.

ii Capital Investment in the Bath Turnpike Roads

Attempts have been made in recent years to estimate aggregate capital formation in the roads, but there has been no study of the process of investment other than this enquiry²². The reconstitution of the finances of one trust cannot make good this deficiency, but it can provide a way to look beyond the generalizations to the sources of capital and pattern of investment.

In a general sense the Bath Trust was representative of its kind²³. It was established in 1707 and is therefore an early trust, but it was substantially reformed in 1757 and so may be included in the 'turnpike boom' of the 1750s and 1760s. Its administrative arrangements span the divide between earlier and later bodies for until 1757 it was a Justice Trust with a small number of commissioners, who were then replaced by a large body of men representing the economic life of the area rather than the county administration. In its road layout too the Bath Trust straddles the usual classifications. It was one of the 'town-centred' trusts of the west country rather than part of the system of 'linear' trusts serving London, but these roles were not mutually exclusive. Although the turnpiking of seven roads into the city was authorized, it was the London Road that was of outstanding importance as part of one of the great routes from the capital to the provinces. In 1707 this section represented 40 per cent of the Trust's total mileage, and although this proportion declined as Bath developed as a

regional centre and its other roads were extended, so that by the 1820s it formed only 10 per cent of the total, it retained its importance in terms of revenue. In the later 1820s as in the 1800s and 1750s, roughly one-third of the annual income from the tolls came from the London Road. Comparisons of mileage are difficult, for trusts varied in their different phases, but in this too it was fairly typical. Controlling about 50 miles when fully formed the Bath Trust was neither one of the few large trusts of over 100 miles nor one of the small number of 10 miles or less.

In terms of the region, a good reason for concentrating on the Bath Trust lies in the superiority of the documentary evidence relating to it, especially the mortgage deeds which can be interpreted to produce a reasonably comprehensive account of its finances that bears comparison with the continuity of evidence analysed in other cases in this study. In contrast virtually no documents relating to the Bristol Trust have survived and some others fare little better, although from the 1820s information can be found in the Quarter Session and Parliamentary Returns beginning then. From the former comes useful evidence on the trustees in the region, for in 1820 an attempt was made to discover how many had met the qualifications required of them as landowners, and how many through personal property²⁴. The reply from the Frome Trust, centred on the clothing town and covering nearly 44 miles, was that of the 68 then living, 32 had qualified on the former

grounds and 36 on the latter. This suggests a balance of interests between town and country which was probably echoed by the Bath and the Wells Trusts though neither was able to give this information, the form of oath taken making no distinction. The more rural Buckland Dinham and Harptree Trusts appear to present a different case for their trustees qualified overwhelmingly as landowners, all 41 in the former and 57 out of 60 in the latter. But far from revealing how different they were from the Bath trustees, a study of their names is a reminder of the extent to which the local gentry and landowners were widely involved in many aspects of regional activity.

The Harptree Trust for example, founded in 1793 and maintaining 27 miles along the northern edge of Mendip to link the main roads crossing it, included the following amongst its original subscribers: John Band the paper manufacturer; John Billingsley with his wide interests; Matthew Brickdale of the Bristol merchant and political family with old lands in West Harptree; William Miles the attorney; Caleb or William Parsons, who provided mortgage funds for the East Harptree enclosure; Henry Strachey of nearby Sutton Court; Francis Edward Whalley, coal proprietor; and Frederick B. Wright, son of Robert, with his extensive lead and coal mining concerns. And a special branch of this road was built to coalworks in Sutton. This interlocking of interests is found also in the Buckland Dinham Trust, re-named the Radstock in 1830 in recognition of its importance to coalmining. Even the Bristol Trust about which so

little is known had in its Act of 1749 (22 Geo.II c.28) some 63 trustees who appear also in the 1755 List of Traders to Africa, as well as others like Henry Strachey whose estate was served by the Harptree Trust but whose Woolley Works depended on the carriage of goods by the Bristol Trust. So the Bath Trust was not distinguished from others in the region by differences between town and country, instead all were linked by the underlying and shared economic interests of many trustees.

This network achieved a physical reality as the roads of the trusts began to ~~to~~ link up. Through a succession of renewal and amendment Acts those of the Bath Trust were gradually extended from the 12.5 miles authorized in 1707 (6 Anne c.42) to 14.75 miles in 1721 (7 Geo.I c.19), 20.15 miles in 1739 (12 Geo.II c.20), 31.2 miles in 1757 (30 Geo II c.67), 41.05 miles in 1759 (32 Geo.II c.51), and 47.9 miles in 1761 (1 Geo.III c.31). The length then fluctuated around 50 miles, for the Acts of 1793 (33 Geo.III c.144) and 1829 (10 Geo.IV c.cx) concerned the building of new roads as major deviations. Surveys by the Trust show an estimated 48.25 miles in 1776, and measured lengths of 52.0 miles in 1787, 47.7 miles in 1791, and 49.19 in 1813. 49.4 miles were measured in the early 1820s and 48.47 miles at the end of the decade²⁵. Two years after the expiry Act of 1876 (39/40 Vict. c.39) the authority of the Trust ceased.

These Acts also contained provisions allowing funds to be raised in a financial market and tolls to be levied on users of

roads. As the practice of the trustees shows, the former provided the long-term capital of the Trust (invested in new and improved roads with their Parliamentary and legal costs), and the latter its current revenue (covering repairs, administration, and interest payments). In Table 9(1) this evidence is classified accordingly, from the mid-eighteenth century when it becomes available, to the early 1830s when the problem is eased by the collection of national statistics. Column 1 confirms the growth of the fund-raising powers of the Trust, for it shows the increase in the permitted level of borrowing from £12,000 in 1757 to £19,000 in 1759, £25,000 in 1793, and £30,000 in 1810. Before the 1750s the limit was £3,000. After the General Turnpike Act of 1822 (3 Geo.IV c.126) all limits were removed.

Evidence on the implementation of these financial powers is hard to find. Account books for the period are difficult to use because of confusion between capital funds and current revenue, construction and administrative costs²⁶. For the Bath Trust not even this unsatisfactory source is available, but fortunately its mortgage deeds have survived in such rare profusion as to allow a reconstitution of its finances. This shows that long-term capital was raised largely on the security of its assets by a process which helped to develop the concept of the 'mortgage' beyond its landed origins. There were essentially two forms of the mortgage deed of the Trust. Before 1793 the tolls formed the only security, and these were assigned to

three landed trustees. Each mortgagee had 'all the Right Title and Interest in and to the said Tolls'. After 1793 (33 Geo.III c.144) the security offered was extended to include the toll-houses and turnpikes, of which the mortgagee was now promised the same proportion as the sum advanced bore to the whole sum subscribed. Also, the tolls were now assigned to any seven trustees, amongst whom local townspeople became dominant. The fact that in both cases mortgagees had equal rights against the securities offered regardless of the date of individual deeds facilitated the raising of capital, for it meant the trustees could borrow at any time without creating a special mortgage, and new lenders had equal status with earlier investors. The funds assumed a permanence associated with share capital rather than a loan, but this concealed a flourishing exchange of deeds in a secondary market alongside the primary one.

The mortgage deeds survived because when paid off they were stored in bundles according to their final ownership. But within these each deed carries its own distinctive history, details on the face showing its nominal value, date of issue, and name and style of the first purchaser, whilst endorsements record details of subsequent changes of ownership. From this evidence, supplemented by minute books, registers of mortgages of tolls, and lists of creditors²⁷, it has been possible to trace back through the network of transactions in the secondary market to the primary holdings of these financial instruments, and so to establish the stages by which the Trust met its

capital requirements from the mid-eighteenth century to the early 1830s. The evidence set out in Table 9(1), columns 2 & 3, confirms that the financial powers given by the renewal and amendment Acts were implemented, but it also shows that for most of the period the process was a gradual one. This gap between authorization and implementation may have owed more to the factors affecting the supply of capital than the timing of demand, for although the trustees could launch their calls at propitious times, the supply of capital was beyond their control. In particular the 'disinterested' character of many investors seeking financial rather than economic returns, and the vitality of the secondary market which deflected funds from primary investment, may both have served to delay the raising of new capital.

In trying to establish the sources of investment capital, the limited involvement of the trustees should first be noted. Only 5 per cent of those elected and 10 per cent of those qualified played any part in the financing of the Trust²⁸. Although they provided about 80 per cent of the capital raised at the mid-eighteenth century reorganization of the Trust, and during the difficult first decade of the nineteenth century, they contributed much less at other times, especially in 1773 when only 25 per cent of the £4,500 then invested came from trustees. Their involvement was also generally shortlived. For example, 70 per cent of the capital sum of £12,000 raised in the late 1750s had been sold in the secondary market within

Table 9(1) *The Long-term Capital and Current Revenue of the Bath Turnpike Trust, 1757-1833*

Year	1 Capital authorized £	2 Capital raised £	3 Long-term capital £	4 Current revenue £	Year	1 Capital authorized £	2 Capital raised £	3 Long-term capital £	4 Current revenue £
1757*	12,000			1,262	1808		350	21,450	8,107 net
1758		12,000		1,683	1809		600	22,050	8,131 net
1759	19,000		12,000		1810*	30,000	2,300	22,100	
1762		800	12,800		1811		150	23,876	10,480
1764			12,000		1812		450	23,834	9,840
1770				4,451	1813		500	23,872	9,954 net
1771				4,524	1814		750	24,135	9,740
1772		500	12,500	4,470	1815		300	23,905	10,600
1773*		4,500	17,000	4,261	1816		100	23,457	10,960
1774*				4,365	1817		200	23,108	10,968
1775				4,520	1818			22,552	11,880 net
1776				4,872	1819		2,000	23,901	11,810 net
1779		2,300	17,000		1820			24,129	11,989 net
1785			17,000		1821		100	23,629	11,999 net
1790		200	17,200	5,859 net	1822*	limit removed		23,029	11,999 net
1791		800	18,000	6,889 net	1823		900	23,579	12,240
1792				7,151 net	1824		4,850	28,279	14,530
1793*	25,000	1,000	19,000		1825			28,279	14,119
1798				7,415	1826			28,279	14,498
1801		1,100	20,100		1827			24,679	13,764
1802		100	20,200	7,556 net	1828			23,929	15,870
1803				7,935	1829*			23,379	15,030
1804				7,794	1830		6,500	29,779	10,935
1805		100	20,700	7,850	1831		13,700	43,079	11,101
1806		600	20,200		1832		2,800	45,629	11,625
1807		500	21,100	8,520 net	1833		1,200	46,679	10,869

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Sources and Notes on following page.

Table 9(1)

Sources: Acts of Parliament and papers of the Bath Turnpike Trust especially the following: S.R.O. D/T/ba, 5, Trustees' Subscription Book to Oaths of Qualification, 1793-1851; 6-12, minute books for 1757-1854; 15, Proceedings of sub-committee for the London Road, 1757-62; 18, Register of Mortgages of Tolls, 1760-82; 19, Register of Mortgages of Tolls, 1801-16; 20, Abstract of Title to Mortgages of Tolls, 1857; 26-40, administrative and financial records relating to receipts from tolls and expenditure on roads; 41, Lists of Creditors for 1785 and 1805; 42, Deeds of mortgage, assignment, declaration etc., 1758-1849. S.R.O. Q/R Turnpike Trust Returns for 1820 and General Statements of Account, 1822-50.

Notes:

- Year: The Trust's accounting system was irregular and therefore figures in Col. 4 cover calendar years (1770-6, 1803-5), years ending in spring (1757-8, 1798-1802, 1807-9, 1816-22), and in autumn (1790-2, 1811-6, 1823-33). All other figures in the table are for calendar years.
- Col. 1: Capital authorized by Act of Parliament, here shown cumulatively.
- Col. 2: Capital raised on the security of the tolls. Figures before 1823 have been reconstituted from mortgage deeds, minute books, and financial papers. Later figures are from the annual General Statements of Account. Unsecured loans from the Trust's bankers after their appointment in 1808 are not included.
- Col. 3: The cumulative mortgage debt. Figures before 1823 have largely been calculated from additional borrowings minus repayments (undertaken on a regular basis by ballot after 1810, when 5% of the tolls was reserved annually of this purpose). The incorporation of firm evidence for 1772, 1806, 1810 (minute books), 1785, 1805 (lists of creditors), and 1820 (Quarter Sessions records), show the calculations are of the right order. Figures from 1823 are from the annual General Statements of Account.
- Col. 4: Income received for the use of the roads, including tolls, payments for overweight, and compositions. These are gross sums, including costs of collection (about £250 p.a. in the 1770s, £400 p.a. in the early 1800s) except when tolls were farmed, and a net figure is then shown. Changes in the scope or rate of toll (shown by an asterisk) had an uncertain effect. In 1829 for example, the imposition of multiple tolls on certain roads, and of charges on draught animals individually instead of on vehicles as a unit, was followed by a sharp fall in the revenue.

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twelve years, reducing the participation of the trustees from the 80 per cent already noted, to 40 per cent. This was a continuing pattern, for the secondary market was dominated by non-trustees to the extent that they purchased 73 per cent of the securities sold in the period studied. The outcome of this reluctance to invest and subsequent disinvestment may be seen in two lists of creditors assembled by the Trust. From these it can be calculated that in 1785 the qualified trustees formed 28.8 per cent of creditors, holding 33.8 per cent of the debt, and in 1805 they formed 33.3 per cent, holding 36.7 per cent. The hybrid nature of this evidence, which blends together holdings built up in the primary and secondary markets, may limit its usefulness in some ways, but not in relation to the important concept of the capital which sustained the undertaking. The trustees held only about one-third of the continuing capital of the Trust.

This feature is puzzling until it is recognized that the financial option involved certain disadvantages illustrated by the case of Ralph Allen, one of the wealthiest trustees and successful Avon Navigator. In 1759 and again in 1761, he offered £1,000 on the security of the tolls provided £700 could be earmarked for the road convenient to his estates, which included the stone mines at Combe Down as well as the great house at Prior Park. But investment in a public undertaking did not ensure control of the use of funds, and when it was ruled that new capital must first be applied to projects specified by

Act of Parliament, the offer was withdrawn²⁹. Other trustees found their economic interests were better served by a direct involvement with the roads, as may be seen from the success of Jacob Mogg, a justice of the peace from 1757, landowner and prosperous coalmaster, already encountered in relation to the Farrington Pit and Somerset Coal Canal. He made no financial investment, but after taking the oath in 1761 he was for 45 years responsible for the construction and maintenance of a new road between Bath and Rush Hill, where it linked up with the Wells and Bristol Trusts³⁰. For an entrepreneur with better uses for his capital, this input of time was in lieu of a financial investment. It also produced a real economic return for it enabled coal from his land-locked mines to be carried more easily to the market in Bath. More than 20 other coal masters also found it worthwhile to be active trustees³¹. The second group whose financial involvement was limited (and declining) was the landed interest, who, contrary to the usual generalizations, held only 27.4 per cent of the debt in 1785, forming 28.8 per cent of the creditors, and 6.5 per cent of it in 1805, forming 17.5 per cent of them³².

In the absence of a sustained interest by these groups, the role of the small urban saver became crucial. The term 'small' is used advisedly because in 1785, 86.5 per cent of the creditors had holdings of £500 or less, forming 52.3 per cent of the whole in value; in 1805, 80.7 per cent held £500 or less forming 39.9 per cent of the whole. In both years only some 7.0

per cent held £1,000 or more, representing one-third of the total sum. The main difference between the two periods was that the proportion of middling investors holding more than £500 but less than £1,000 increased from 5.8 per cent in 1785 to 12.3 per cent in 1805, and the value of their holdings rose from 12.9 per cent to 23.9 per cent of the whole. The relative importance of the urban savers can be judged from Table 9(2) which deals with the primary capital market; Table 9(3), which concerns the secondary market; and Table 9(4) in which cross-sections for particular years summarize the results of participation in both markets. The system of classification has already been set out in Figure 1, p.291. and its debt to that devised by J.R.Ward for his analysis of the financing of canals explained. One modification relates to changes of status, for whilst the present analysis deals with investment over time, Ward was concerned with original shareholders. The problem has been met by incorporating these changes so that a porter brewer like William Clark has been moved to the category of capitalist when his designation as esquire by contemporaries has indicated both a change in the scale of operations and an accumulation of private assets, although the earlier business may have remained the source of income³³.

The first three columns in each table comprise the rural interest. Ward's categories have been extended to include country-based mining proprietors and clothiers with the country gentry (col.2), and rural tradesmen such as victuallers with

the farmers (col.3). The rest (cols.4-10) make up the urban interest, mostly in the case of the study of the Bath Trust, resident in that city. They include capitalists or urban gentlemen (col.4) whose ranks were increased by the infusion of successful men from other spheres; tradesmen (col.6), including upholsterers and saddlers as well as the grocers, ironmongers, and lesser merchants of Ward's lists; and professional men (col.7), including architects and musicians as well as Ward's attorneys, surgeons, and apothecaries. The contribution made by all of these groups may be seen in the three tables. The low profile of manufacturers (col.5) with other uses for their funds is not surprising. But they and clergymen (col.8) were briefly important in the 1770s and again after the turn of the century, when there were also occasional contributions from smaller tradesmen such as butchers and coal merchants, and from artisans investing individually or through friendly societies (col.10). Women deserve a special mention, especially as their role has been described elsewhere as 'marginal'³⁴. They were important in volume of subscriptions as well as numbers, especially in the 1770s when they provided 46 per cent of the capital then raised. They covered a wide social and economic range including gentlewomen, widows and daughters of professional and tradesmen, lodging housekeepers pursuing a vigorous economic life of their own, and occasionally servants, identified in relation to those employing them.

Table 9(2) *Capital Raised on the Mortgage Deeds of the Bath Turnpike Trust, 1758-1833: An Analysis of Investors*

Year	Capital raised £	1 Peers £	2 Gentry £	3 Farmers £	4 Capitalists £	5 Manufacturers £	6 Tradesmen £	7 Professionals £	8 Clergy £	9 Women £	10 Institutions £
1758-9	12,000		200		5,300		1,000	5,000		500	
1762	800		500		300						
1772	500		250		50			200			
1773	4,500		250	500	500		100		750	2,400	
1779	2,300		600	250		500				950	
1790	200							200			
1791-5	1,800							1,400		100	
1796-1800											
1801-5	1,300		200		400	100	100	200	100		100
1806-10	4,350		100		700		600	1,500	450	1,000	
1811-5	2,150		200	150	900	250	450		50	50	100
1816-20	2,300				700					500	100
1821-5	5,850				1,300		900	500		100	
1826-30	6,500				2,500		1,000			2,000	
1831-3	17,700				300					2,100	

Sources: See Table 9(1)

Notes:

- 1 See the text for an explanation of the method of classification. In later years some investment remains unclassified, due to lack of evidence.
- 2 After 1790 the years have been grouped, since capital could then no longer be raised as required. Easier conditions began to return in the 1820s, and in 1830 an advertisement for £6,000 at 4% produced offers totalling £21,000 (S.R.O. D/T/ba, Min. Bk. 12, 3 July 1830).

Table 9(3) *The Secondary Market in the Mortgage Deeds of the Bath Turnpike Trust, 1759-1835: An Analysis of Purchasers*

Year	Securities sold £	1 Peers £	2 Gentry £	3 Farmers £	4 Capitalists £	5 Manufacturers £	6 Tradesmen £	7 Professionals £	8 Clergy £	9 Women £	10 Institutions £
1759-60	1,250		50				150	1,000			50
1761-5	7,750		2,000	100	1,000		2,000	1,700		950	
1766-70	2,300									2,300	
1771-5	3,150		500		1,000		900	100	150	500	
1776-80	7,900		600	850	500	400	2,000	500	850	2,200	
1781-5	5,650		700	650	450		1,600	1,000	500	750	
1786-90	2,650		1,000		200	700	50	200		500	
1791-5	4,200				1,300		900	1,550		450	
1796-1800	5,450			200	1,500		2,850			900	
1801-5	3,400		200	150	1,350		100	400	400	700	100
1806-10	2,400			250	1,450		450	50	100	100	
1811-5	1,750			350	1,000	100	100			50	150
1816-20	1,400			200		50	300	300		550	
1821-5	1,500							1,100		400	
1826-30	700				300					400	
1831-5	2,000						1,000		1,000		

Sources: See Table 9(1)

Table 9(4) *The Long-term Capital of the Bath Turnpike Trust: An Analysis of Creditors in the Years 1785 and 1805*

Year	Mortgage debt £	1 Peers £	2 Gentry £	3 Farmers £	4 Capitalists £	5 Manufacturers £	6 Tradesmen £	7 Professionals £	8 Clergy £	9 Women £	10 Institutions £
1785	Value of deeds held: £17,000		2,700 15.9%	1,950 11.5%	4,300 25.3%		3,000 17.6%	950 5.6%	400 2.3%	3,700 21.8%	
	Number of creditors: 52		5	10	6		6	2	3	20	
1805	Value of deeds held: £20,700 including £500 with unspecified creditors		800 3.9%	550 2.7%	6,750 32.6%		5,450 26.3%	1,250 6.0%	600 2.9%	4,500 21.7%	300 1.5%
	Number of specified creditors: 56		5	5	12		7	4	3	17	3

Sources: See Table 9(4) In particular S.R.O. B/T/ba 41, Lists of creditors for 1785 and 1805

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through the adaptation of their role from a former emphasis on matching the financial needs of known clients in a personal capital market, to that of soliciting funds from unknown clients (through notices on turnpike gates and later by newspaper advertisements) for investment in public utilities with which the savers had no close economic concern³⁶. For the Bath Trust the attorneys at the centre of these developments were, Richard Roberts from 1757, Walter Chapman from 1772, Philip George from 1782, and his son of that name from 1809. Their rewards came from the salary paid for routine administration, and from the additional legal work which included drafting bills, assisting their conduct through Parliament, consulting counsel on the trustees' powers, determining ownership and conveying property, and creating financial instruments for raising capital. The importance of the last named is shown by the fact that the fee for executing institutional mortgage deeds rose from 2s.6d in 1760 to 15s.0d in 1782, whilst the clerk's salary remained the same, at £35 per annum.

The market operated by the Bath Trust did not exist in isolation, but was part of a general pattern in the area. By the mid-eighteenth century borrowing at interest by the Corporation of the city of Bath was already well established on the security of bonds given under the Common Seal, and in the twenty years from 1757, during which the Trust raised £17,000, the Council borrowed a very similar sum³⁷. Between 1778 and 1786 a total of £10,700 was raised by the Corporation, largely

on a new form of bond made out in units of £100 instead of being determined by the sum offered. But there was little Corporation borrowing at the end of the decade, probably because the newly formed Bath Improvement Commissioners raised £25,000 in the years 1789-91³⁸. A classification of investors in this urban renewal scheme on the basis described earlier shows that 9.2 per cent of the capital subscribed came from the landed interest, 50.2 per cent from the urban gentry and substantial merchants, 6.0 per cent from tradesmen, 13.2 per cent from the professions and 21.4 per cent from women. Manufacturers and clergy made no contribution. The rural interest thus played an even smaller part than in funding the roads, but the urban capitalists were more important. Meanwhile, and more slowly, the Bath Trust had increased its total capital raised from the £17,000 already mentioned for the 1770s to £20,300 by 1791, at a pace that suggests its funding was dovetailed with, and delayed by, the activities of the other two institutional borrowers. To the saver however, this network gave the advantage of alternative opportunities, and encouraged familiarity with the mechanics of the market.

The mortgage deeds of the Bath Trust were attractive financial instruments because they were relatively risk free, available in small units of £50 (though with some of £100, especially from the turn of the century), and capable of holding their nominal value. They could be sold with ease when assets had to be realized. The highest proportion of turnover

in the secondary market to which this gave rise was between 1761 and 1765, see Table 9(3), when deeds to the value of £7,750 changed hands out of a mortgage debt of £12,000. Sales were even higher between 1776 and 1780, but so was the mortgage debt. The vigour of these exchanges suggests that this secondary market may have been limited in other years, not by a shortage of funds but by a lack of deeds for sale. Possibly one-fifth were held as long-standing investments, devised by will or coming on the market only when sold by executors, for over 20 per cent of the £12,000 raised in the later 1750s was disposed of in this way, and the list of creditors for 1805 shows a similar proportion of the capital sum then held by executors. But most deeds circulated more rapidly, held for a short time before being resold, perhaps by a tradesman 'having an occasion for the said £50' as some endorsements said. The period of greatest velocity was the decade from the early 1790s when the various financial securities of the Trust, the Bath Corporation, and the Improvement Commission changed hands with great rapidity, even several times in one year. This activity, see Table 9(5), at a time of difficulty in raising new capital, suggests that the marketability of the deeds may have deflected savings from investment in new works.

The negotiation of terms on which investment capital could be raised also tended to cause delays. For example after an initial offer of 3.5 per cent in 1757, the trustees were less than a year later obliged to settle on 4.0 per cent in order to

Table 9(5) *The Secondary Market in Institutional Securities in Bath, 1789-1804*

Year	1 Bath Corporation £	2 Bath Turnpike Trust £	3 Bath Improvement Commission £	4 Total sums involved £
1789			100	100
1790		900		900
1791		800	500	1,300
1792		250	2,500	2,750
1793		500	2,700	3,200
1794	17,400		300	17,700
1795	1,000	2,650	1,100	4,750
1796	7,000	200	2,150	9,350
1797	4,150		100	4,250
1798	1,300	1,400	2,100	4,800
1799	900	2,850	400	4,150
1800	600	1,000	2,000	3,600
1801	2,700	1,850	400	4,950
1802	2,250	500		2,750
1803	900		500	1,400
1804		1,050	100	1,150

Sources: As for Table 9(4). In addition, B.G.A. Minute Books of Bath Corporation, 1757-1834; Book of Account of the several Sums of Money borrowed by the Corporation of Bath, 1765-1803; Account Book of the several Bonds made out in the nature of East India Bonds, 1778-1803; Order Books of the Bath Improvement Commissioners, 1789-1832 and Bond Book of the Improvement Commissioners, 1789-1823.

Notes: The table covers the years from the first sale of a deed of the Bath Improvement Commission to the last available evidence on the deeds of the Bath Corporation. The secondary market in the latter did not necessarily cease at this point, for after a similar absence of evidence a decade earlier the registration of transactions totalling the unusually high sum of £17,400 in 1794, suggests that this was probably a retrospective figure covering sales from the preceding years.

secure £12,000. Between December 1760 and June 1764 the rate had to be raised to 4.5 per cent, and in the course of this period (in 1762) the trustees had to pay 5.0 per cent on a further £800 in order to start work on the new road to be built by Jacob Mogg already mentioned³⁹. Rather than showing caprice on the part of investors these negotiations reflect the general financial conditions of the time, and so provide further evidence that savers were influenced by these more than by economic motives. The offer of 3.5 per cent in 1757 represented both the going local rate (Bath Corporation had just negotiated a loan of £600 at that price) and the return on long-term London securities as shown by yields on Bank stock and the Funds⁴⁰. The rate in the London and provincial markets then fluctuated upwards in a trend associated with the Seven Years War (1756-63), with Bank stock approaching a yield of 5.0 per cent in 1762. It is therefore not surprising that potential investors held back until the Bath Trust also offered higher rates to secure the capital required. The Trust rate was reduced to 4.0 per cent from June 1764 until December 1778, when an increase to 4.5 per cent was associated with the need to raise £2,300. The London rate also fell from the mid-1760s, rising again during the War of American Independence (1776-83), especially in the years from 1778 when it reached 4.5 per cent and then fluctuated around 5.0 per cent. From the mid-1780s to the mid-1790s it fell again, reaching almost record low levels in 1792. From 1788 the Bath Trust tried similarly to lower the rate. They achieved this briefly in 1792/3 with a reduction to

4.5 per cent, as the Corporation and Improvement Commissioners did too, but were then thwarted by their creditors who threatened withdrawal unless the rate returned to 4.5 per cent. The trustees had to agree and the rate remained at 4.5 per cent until December 1796 when they sought £1,300 for a new road, and it was raised to the legal limit of 5.0 per cent. The rates of the Bath Corporation and Improvement Commissioners were similarly raised to 5.0 per cent in 1796-7, and the London yield was also then rising, fluctuating around the 5.0 per cent level during the French and Napoleonic Wars. Not till the early 1820s were the rates in Bath reduced to 4.5 per cent⁴¹.

These similarities of movement may suggest that Bath was metropolitan in character rather than provincial, but there is evidence to show that despite its importance as a fashionable spa it remained very much a part of its region. The financing of the Bath Trust for example was almost completely detached from the speculative and building activity in the city, so that only some 7.5 per cent of those funding it can be found in the pages of Neale's comprehensive study of the making of Bath, and then perhaps in lists of councillors granting permission for building works. Lewis Clutterbuck, attorney and town clerk from 1757 to 1776, provides an example of the separation of these markets, for although he loaned speculative funds to John Wood the younger, he only did so after divesting himself by twelve separate transactions between 1759 and 1764, of an earlier investment of £5,000 in the Bath Trust. There were differences

in timing too, for after the major investment of the later 1750s, fund raising by the Bath Trust did not coincide with the building booms identified by Neale and described as 'embedded in the national money market'. Some capital was raised in the two periods singled out, 1762 to 1771 and 1785 to 1792, but borrowing by the Trust was heavier in the intervening years⁴².

No evidence has been found of institutional links between the Trust and the metropolis for most of this time, other than in pursuit of Parliamentary business, or through consultations with counsel on such matters as compulsory purchase. No use was made of the developing banking system until 1808 when Messrs Clement and Tugwell of Bath (both qualified trustees) became treasurers. Before that funds were handled by local businessmen, for example linen drapers and wine merchants, holding annual balances of over £1,000 by the end of the eighteenth century. Nor has any overlap emerged between metropolitan and provincial savers, for investors in the Trust were largely residents not visitors. In the absence of a causal connection however, it may be that these financial markets were similarly but independently influenced by the comparable motives of investors, and that the disinterested provincial savers were close in attitude if not in scale of investment to the merchants, professionals, tradesmen and women of London seeking financial returns from government and related stock⁴³.

Turning from the sources of capital to its employment in the roads, it can be said that the life cycle of this asset is unusual enough to qualify for inclusion with Feinstein's 'Really awkward cases'⁴⁴. Once built, roads appear to be everlasting, yet require constant maintenance whilst never being completely renewed. One answer to this problem is not to capitalize all expenditure, but to include improvements (for example road widening, the removal of difficult corners, and lowering of hills), with new construction (alternative lines as well as new roads) as gross capital formation. The costs of construction encompass professional and legal fees (including Parliamentary costs) and land purchase, for without these items the work could not have been undertaken. Unhappily, evidence on expenditure to which these principles could be applied with confidence is lacking. However the documents from which information on the sources of finance was derived have been similarly used to reconstruct the employment of capital. The general problem of distinguishing between new works and improvements on the one hand and repairs and maintenance on the other remains. The trustees occasionally felt the need for this distinction as is shown by a resolution of 1796 that the accounts for improvements and repairs be kept separately, but not until 1825 in the annual returns to be referred to later, was this aspiration actually achieved⁴⁵.

Before studying the rare items of more detailed information, some generalizations can be made from the figures in Table 9(1)

which provide the only evidence covering the whole period. First it would be fair to say that until after the turn of the century the cost of new work and improvements including Parliamentary and legal expenses, came largely from capital raised on the mortgage of tolls, whilst repairs and maintenance, salaries and administrative costs, and the interest on the debt, were met from the current revenue, chiefly the tolls. Secondly, with the growth of traffic and higher tolls, current revenue increased in importance as a source of funds, both in absolute terms and also relative to the capital raised. From an annual figure of below £2,000 in the 1750s the tolls had more than doubled to £4,500 in the 1770s, increasing to £7,000 at the turn of the century and doubling again to more than £14,000 in the 1820s, when they constituted one-half of the debt then outstanding in contrast to one-sixth in the 1750s. Thirdly, expenditure on repairs did not increase in proportion to the increase in current revenue. In 1776 the sum of £4,069 spent on the repair of the roads represented four-fifths of the income from the tolls, but this proportion had been reduced to three-quarters by 1791, and when J.L.McAdam was appointed general surveyor in 1826 he contracted to sustain the roads for £7,500 in the coming year, which was about half the current revenue from the tolls⁴⁶.

Fourthly, the growing surplus after covering repairs meant that some capital works could be financed from revenue, giving the trustees a degree of independence from delays in the

financial market. By distinguishing between repairs and improvements, the accounts for the years 1825 to 1833 (but with the exception of 1829) allow this matter to be taken further. As Table 9(6) shows, expenditure on repairs in this period always fell short of revenue from the tolls. But the surplus was not invested immediately in new works. It was built up into a balance-in-hand of over £8,000 which then formed a vital supplement to the capital sum of £24,000 raised towards the cost of the major new works authorized in 1829. Altogether nearly £28,000 was invested in the surge of construction in these years, and when legal costs of £3,000 are added to this sum, the full importance of the part played by surplus revenue in McAdam's schemes becomes clear. This deferred investment is one of the hazards encountered when rescuing capital from revenue. A second is illustrated by the career of Benjamin Wingrove, appointed in 1817 as the Trust's first professional surveyor, and McAdam's predecessor. His commitment to sound construction in the Telford tradition meant that much work of improvement, especially of the foundations of the roads, was undertaken as routine along with the repairs, and financed from revenue in anticipation of the trend towards funding investment from income.

The distribution of costs is the next aspect of this subject to be considered, and the evidence available has been assembled in Table 9(7). This shows that in the 1770s the Trust spent on average 77.7 per cent of its income on the repair of the roads

Table 9(6): The Expenditure of the Bath Trust on Repairs and Improvements, showing the proportion of road costs spent on each, 1825-1833

Year	Current Revenue from tolls £	Expenditure on the Roads					Cost of Repairs per mile £
		Repairs		Improvements		Total	
		£	%	£	%	£	
1825	14,119.2	10,261.1	97.3	282.0	2.7	10,543.1	207.7
1826	14,497.9	8,578.4	98.2	155.9	1.8	8,734.3	173.6
1827	13,763.8	7,826.1	92.1	671.9	7.9	8,498.0	158.4
1828	15,870.4	7,501.6	90.2	817.8	9.8	8,319.4	151.9
1830	10,934.9	7,076.0	61.5	4,438.5	38.5	11,514.5	143.2
1831	11,101.0	7,072.3	35.3	12,950.3	64.7	20,022.6	143.2
1832	11,624.8	7,156.5	47.8	7,815.7	52.2	14,972.2	144.9
1833	9,949.8	7,223.9	74.3	2,503.7	25.7	9,727.6	146.2

Source: "Abstract of the General Surveyor's Expenditure" 1825-1833.

NOTE: At this time the Trust controlled 49.4 miles of road

General Notes on Tables 9(6), 9(7), 9(8)

1 Information comes from SRO, Q/R Turnpike Trust Accounts 1822-50. 'General Statements of Income and Expenditure of the Bath Turnpike Trust' 1823-33 and 'Abstracts of the General Surveyor's Expenditure' 1825-33.

2 Expenditure on the roads covers labour;rent of quarries;cost and carriage of materials;damages;building and maintenance of houses,bridges,gates;incidentals including drawing plans.

3 Administrative costs cover salaries (clerk,treasurer,tolls inspector,gatekeepers);printing;stationery;advertisements.

4 Surveyors' salaries were included in 'General Statements' as an administrative cost,and in 'Abstracts' as a road making cost.

5 The 'General Statement' and 'Abstract' for 1823 cover Jan.1 to Sept.30,which thereafter marked the end of financial year.

Table 9(7): The Distribution of Costs of the Bath Turnpike Trust 1770-1776 and 1825-1833, showing expenditure as a proportion of the income from tolls

Current Year Revenue from tolls £		Expenditure						Total expend- iture under these heads £
		Repair of Roads		Interest pay- ments		Administrative costs		
		£	%	£	%	£	%	
<u>PART A</u>								
1770	4,451.0	3,242.5	72.8	480.0	10.8	(373.0)	8.4	4,095.5
1771	4,524.5	3,481.5	76.9	480.0	10.6	(373.0)	8.2	4,334.5
1772	4,470.2	3,744.8	83.8	500.0	11.2	(373.0)	8.3	4,617.8
1773	4,260.6	3,594.0	84.4	680.0	16.0	(373.0)	8.8	4,647.0
1774	4,364.6	3,103.2	71.1	680.0	15.6	(393.0)	9.0	4,176.2
1775	4,519.7	3,219.6	71.2	680.0	15.0	(393.0)	8.7	4,292.6
1776	4,871.8	4,068.7	83.5	680.0	14.0	392.8	8.1	5,141.5
<u>PART B</u>								
1825	14,119.2	10,261.1	72.7	1,297.2	9.2	654.7	4.6	12,213.0
1826	14,497.9	8,578.4	59.2	1,396.6	9.6	823.5	5.7	10,798.5
1827	13,763.8	7,826.1	56.9	1,205.9	8.8	265.9	1.9	9,297.9
1828	15,870.4	7,501.6	47.3	1,172.3	7.4	1,157.9	7.3	9,831.8
1830	10,934.9	7,076.0	64.7	1,212.1	11.1	1,450.2	13.3	9,738.3
1831	11,101.0	7,072.3	63.7	1,417.1	12.8	(932.5)	8.4	9,421.9
1832	11,624.8	7,156.5	61.6	1,905.4	16.4	(400.0)	3.4	9,461.9
1833	9,949.8	7,223.9	72.6	2,073.6	20.8	(184.1)	1.9	9,481.6

Sources: Summary of Accounts 1770-1776; "General Statements" 1825-33; and "Abstracts of the General Surveyor's Expenditure" 1825-1833.

- NOTES:
- 1 New works and improvements have been excluded from Part B to allow a comparison with the 1770s.
 - 2 Brackets indicate estimated figures. Those in Part A were made on the basis of the general administrative costs (salaries, printing, oil and ink etc.) having remained constant, but the total wages paid to the toll gatherers having increased from 1774 when a tenth gate was opened.
 - 3 In Part B the surveyors' salaries have been deducted from the administrative costs because they were already included under repairs. However, because they were not specified in the "Abstracts" for 1831-1833 an estimation has been made for those years based on the total for the previous year of £1,180.
 - 4 In Part A the sums spent servicing the debt have been calculated on the basis of the known mortgage debt and interest rate.

Table 9(8): The Resources Available to the Bath Trust and their Disposition, 1823-1833

Year	Resources Available				Disposition of Resources						
	Balance in hand	Current income	Capital raised	Total	Roads (repairs and improvements)	Legal Costs	Capital Repaid	Interest Payments	Administrative Costs	Reserve Fund	Total
	£	£	£	£	£	£	£	£	£	£	£
1823	976.8	8,908.0	900.0	10,784.8	8,069.7 74.8%		500.0 4.7%	1,105.1 10.2%	1,052.2 9.8%	57.8 0.5%	10,784.8
1824	57.8	14,827.0	4,850.0	19,734.8	16,728.3 84.8%			1,118.5 5.7%	1,817.4 9.2%	70.6 0.3%	19,734.8
1825	70.6	14,453.4		14,524.0	11,249.1 77.5%			1,297.2 8.9%	901.6 6.2%	1,076.1 7.4%	14,524.0
1826	1,076.1	14,839.6		15,915.7	8,840.5 55.5%			1,396.6 8.8%	1,174.2 7.4%	4,504.4 28.3%	15,915.7
1827	4,504.4	13,771.1		18,275.5	7,762.7 42.5%		3,600.0 19.7%	1,205.9 6.6%	1,300.7 7.1%	4,406.2 24.1%	18,275.5
1828	4,406.2	15,878.2		20,284.4	7,952.8 39.2%		750.0 3.7%	1,172.3 5.8%	2,190.7 10.8%	8,218.6 40.5%	20,284.4
1829	8,218.6	15,588.9		23,807.5	13,519.2 56.8%	1,601.2 6.7%	550.0 2.3%	1,177.5 4.9%	2,420.0 10.2%	4,539.6 19.1%	23,807.5
1830	4,539.6	11,427.6	6,500.0	22,467.2	13,212.8 58.8%	765.0 3.4%	100.0 0.5%	1,212.1 5.4%	2,632.3 11.7%	4,545.0 20.2%	22,467.2
1831	4,545.0	11,285.5	13,700.0	29,530.5	19,506.4 66.1%	427.7 1.4%	400.0 1.4%	1,417.1 4.8%	2,112.5 7.1%	5,666.8 19.2%	29,530.5
1832	5,666.8	11,624.8	2,800.0	20,091.6	14,593.6 72.6%		250.0 1.2%	1,905.4 9.5%	1,579.5 7.9%	1,763.1 8.8%	20,091.6
1833	1,763.1	10,162.1	1,200.0	13,125.2	9,184.0 70.0%	241.9 1.8%	150.0 1.1%	2,073.6 15.8%	1,364.1 10.4%	111.6 0.9%	13,125.2

This comprehensive view of the finances of the Trust is based on the 'General Statements'.

(plus 13.3 per cent on interest payments and 8.5 per cent on administration), whilst between 1825 and 1833 the comparable proportion was 62.3 per cent (plus 12.0 and 5.8 per cent). The fact that the Trust does better in this scrutiny (based on Albert's attempts to assess efficiency⁴⁷), in the earlier than the later years suggests that the use of these three criteria alone may reward those uncomplicated trusts that emphasised repairs, and penalize the possibly more efficiently managed ones whose expenditure also covered some improvements. An attempt has been made to test this suggestion by exploring the wider financial context of the Bath Trust for the years for which this evidence is available, 1823-33. Table 9(8) shows the resources of the Bath Trust and their disposition. As the former included the balance-in-hand and borrowed capital as well as current income from tolls, fines, and rents, the term 'income' has been avoided, as has that of 'expenditure' for a major item in the later 1820s was the building up of a reserve fund. Legal costs and capital repayments were further claims on resources in addition to the items which formed the basis of the earlier analysis: spending on the roads (now including improvements), administration (now including the surveyor's salary according to the conventions of the 'General Statements'), and interest payments. The average expenditure of 63.5 per cent on the roads, 7.9 per cent on interest, and 8.9 per cent on administration are very similar to the previous results, but the greater detail allows other items to be revealed, especially the reserve fund built up to finance future road investment.

Lastly it is worth noting that the two parts of Table 9(7) represent respectively the earlier years when the trustees managed all activities (including riding on the roads to oversee construction, assisted by surveyors who were little more than foreman), and the later years when professionals assumed these tasks. This transition from control by disinterested gentlemen to that by salaried officials was not accomplished smoothly. In the course of and accelerating the change there was a curious decade from about 1807 to 1817 when the trustees' supervision of finance and organization weakened. There were problems with investors wishing to withdraw their capital and place it to advantage elsewhere, labourers and carters asking for increased wages, travellers evading tolls, sometimes in collusion with collectors, and coach proprietors and passengers complaining of the condition of the roads⁴⁸. Although to some extent victims of the general economic conditions of the time, the trustees' failure lay more fundamentally in their inability to cope with the problems posed. Faced with rising costs and a general indebtedness they suffered a collective loss of nerve, for their amateur approach was no longer equal to the situation. But instead of turning then to the professionals, the trustees took the backward step of reorganizing the roads on the basis of the parishes and statute labour, which solved none of the problems.

Their reluctance to deal with professionals, although such appointments were familiar from the 1790s for coal mining,

canal building, and land drainage projects in the region, was probably due to the fact that despite the accumulation of capital invested in the roads over the years, the actual work of construction and maintenance was highly labour intensive and therefore thought to need only the supervision of gentlemen used to handling workmen in their businesses or on their estates. The evidence assembled in Table 9(9) on the relative costs of labour and materials in the decade from 1823, ^{shows} the former accounted for almost 65 per cent of the total. The accompanying figures for 1791 suggest that labour costs then represented only 45 per cent of the total but this is an undervaluation for stone was then generally taken from common or private ground with payment only for damage done, and it should therefore be a charge on wages rather than materials. On re-adjustment, the labour costs can be shown to have been very similar to later years, at 59 per cent. The practice of obtaining materials in this way remained well-established, for despite a small expenditure on the rent or purchase of good quarry ground from the 1780s, not until 1807 was the buying of road stone even considered⁴⁹.

The Bath trustees' attempt to abrogate their duty by handing responsibilities to parish highway surveyors, paying each a fixed sum, aroused such opposition that in 1816 they turned for advice to the recently appointed general surveyor of the Bristol Trust John L. McAdam, whose work was proving to be both efficient and economical. McAdam studied the Bath roads and

Table 9(9): The Relative Cost of Materials and Labour, The Bath Trust 1791 and 1823-1833

Year	Total Cost of Materials and Labour Accounted For £	Cost of Materials					Cost of Labour					Part A
		Stone Quarried £	Land bought for Quarrying £	Cart Hire £	Paper and Sundries £	Total £	Labour £	Stone broken £	Carpenters & Smiths £	Masonry £	Total £	
1791	4,966.7	713.3	24.7	1,974.8	20.0	2,732.8	1,771.1	304.9	103.1	54.8	2,233.9	
	Total Cost of Materials and Labour Accounted For £	Rent of Quarries & Cost of Stone Purchased £	Land Purchased and Damages Paid £	Repair and Building of Houses Gates and Bridges £	T o t a l		Day Labour £	Team Labour £	Contract Work £	T o t a l		Part B
					£	%				£	%	
1823	7,693.7	1,432.1	1,485.4	34.9	2,952.4	38.4	1,006.1	1,736.4	1,998.8	4,741.3	61.6	
1824	15,614.0	2,163.1	3,871.5	982.9	7,017.5	44.9	1,457.8	3,014.4	4,124.3	8,596.5	55.1	
1825	10,303.7	2,007.5	102.1	858.7	2,968.3	28.8	1,305.1	2,758.6	3,271.7	7,335.4	71.2	
1826	8,316.2	2,117.1	293.3	177.6	2,588.0	31.1	1,389.9	1,937.3	2,401.0	5,728.2	68.9	
1827	7,303.1	1,725.4	79.6	61.6	1,866.6	25.6	1,247.7	2,206.7	1,982.1	5,436.5	74.4	
1828	7,393.0	1,647.3	202.4	234.3	2,084.0	28.2	1,461.2	1,593.8	2,254.0	5,309.0	71.8	
1829	12,653.4	1,830.1	1,575.6	146.1	3,551.8	28.1	1,764.9	2,373.8	4,962.9	9,101.6	71.9	
1830	12,362.9	1,660.9	1,957.4	1,506.6	5,124.9	41.5	1,679.8	2,008.3	3,549.9	7,238.0	58.5	
1831	18,651.1	1,796.1	4,091.9	2,468.9	8,356.9	44.8	1,672.8	2,302.6	6,318.8	10,294.2	55.2	
1832	13,065.3	1,664.7	2,289.7	1,787.1	5,741.5	43.9	1,792.9	2,210.0	3,320.9	7,323.8	56.1	
1833	8,809.1	1,464.6	2,191.3	56.5	3,712.4	42.1	1,474.8	1,344.9	2,277.0	5,096.7	57.9	

Sources: S.R.O. D/T/ba Vol. 8, 5 November 1791, "General Statements" 1823-1833 and "Abstracts of the General Surveyor's Expenditure" 1825-1833.

NOTE: In 1791 the cost of materials accounted for 55 per cent of the expenditure on the roads, and the cost of labour 45 per cent. Between 1823 and 1833, however, the average proportions were 36 per cent on materials and 64 per cent on labour.

presented his report in February 1817⁵⁰. His strongest recommendation was that the Commissioners should resume control of the roads, establishing an adequate executive for their management and appointing salaried surveyors able to give that 'constant zealous and unwearied attention which a proper discharge of this duty require'. The identification of the problem in these terms is significant for it emphasizes that the investment of capital measures intention not achievement in the matter of the standard of the roads. He acknowledged that the trustees had not been miserly for the roads were 'over loaded with materials', but the lack of executive control and professional standards had prevented the efficient utilization of the capital outlay.

The trustees took these criticisms seriously. They rescinded the orders placing the roads in the hands of the parishes and appointed their first professional surveyor⁵¹. Not McAdam who received 53 votes, but Benjamin Wingrove who secured 55. An experienced surveyor and land steward, the latter was also a trustee (elected in 1793, qualifying in 1810), and this may have told in his favour for as one of their number he presented less of a break with the past. But he proved a costly choice on two major counts. First, he was a strong supporter of weighing engines, justifying in a pamphlet of 1821 the ten then on the Bath roads at a cost of nearly £2,000, as a necessary protection against an otherwise excessive weight of coal and stone brought daily into the city. But he overlooked the fact

that since their introduction in 1768 they had been a constant source of trouble requiring frequent adjustment, repair, and replacement⁵². Their cost stands out all the more as apart from the toll houses and gates they were the only major items of fixed capital expenditure. Secondly his road building and repair was in the expensive Telford tradition with good foundations and sound drainage, but the latter's work was financed substantially by government contract whilst the Bath Trust had to struggle to meet these heavy costs from its own resources. Meanwhile the Bristol Trust was benefitting from the economies of McAdam who claimed that foundations were of less importance than the method of applying the road materials which should bond together to form a mass resilient to the heaviest weights⁵³.

Wingrove began to lose the confidence of the trustees, especially after he had been joined in 1823 by his intemperate son Anthony who referred to members of a committee daring to criticise as 'Blackguards'. The trustees decided to test the validity of the claims of the rival schools by having one of their districts maintained on McAdam's system, its accounts kept separately to allow an assessment to be made. At this challenge to their professional competence the Wingroves resigned in January 1826 and McAdam was approached by the trustees. His offer to maintain good roads for £7500 per year over five years was accepted, for this was an attractive economy on the Wingroves' expenditure on repairs of about

£10,000 per year⁵⁴. This reduction was reflected in a fall in the cost of repairs per mile from over £200 in 1825 to an average of £148 between 1827 and 1833, see Table 9(6). These economies relieved the trustees of their immediate worries and the surplus, together with the capital raised in the local financial market, enabled them to embark on the new and large-scale construction work planned by McAdam to provide a better eastern approach to the city than the hilly descent from Kingsdown. With McAdam the Trust came to adopt a more positive approach to investment in the roads.

iii Conclusions

The gap between this detailed reconstitution of the sources and investment of capital by the Bath Trust, and the more general comments on roads, rivers, and canals made earlier, may seem too great to allow any general conclusions to be drawn. But if viewed within the unifying theme of the developing economy of north Somerset, then a general interpretation becomes possible in terms of the interlocking web of interests of entrepreneurs who had a business interest in the construction of transport facilities, and the disinterested savers and speculators seeking primarily financial returns, although these groups were not of course mutually exclusive. Representatives of the former included for example Ralph Allen, John Billingsley, Jacob Mogg, and John Thomas, all of whose involvement in the region was so wide-ranging that it is

difficult to pin upon them the simple appellation of landlord, quarry owner, brewer, coal master, or Bristol merchant. But it was their investment of time and energy, and sometimes funds, which launched and managed schemes designed to produce personal and public returns. Playing a vital but supportive role in this network were the professionals, attorneys like William Miles and surveyors like William Smith, whose range of activity matched that of the entrepreneurs, although the surveyors came late to the scene perhaps because their skills were thought earlier to be those possessed by any gentleman improver.

The inclusion of McAdam in this catalogue of local names may seem incongruous as he is more usually thought of as the archetypal Scotsman who came south and quickly made a national name by providing qualities (in this case scientifically-based surveying and road making skills, and efficient management techniques) in short supply south of the border. But in fact after some disastrous business ventures in Scotland McAdam lived a life of obscurity in Bristol for 15 years from 1801 about which his biographers remain silent⁵⁵. He may have been a merchant, for when the Bristol Commercial Rooms were opened in 1811 as a coffee house and club for merchants he was the first president⁵⁶. He became a trustee of the Bristol Turnpike Roads, and by 1816 he was well-enough established to become their surveyor. It was thus the hinterland of Bristol (especially north Somerset where that Trust then controlled some 70 miles of road), that became McAdam's nursery. Within a year his work

on the line towards Shepton Mallet (the A37) had brought him to the attention of Sir John Coxe Hippisley, who recommended him to the Postmaster General for the excellence of his work on the road which passed his house at Ston Easton⁵⁷. Sir John was a Bath trustee and so may have been influential in the invitation to McAdam to report on their roads. On the basis of his experience in this region McAdam began to extend his activities by working for other trusts. But however widely his influence spread, his professional and personal network continued to be based in the west country through his association with the Bristol, Bath, Shepton Mallet and Frome Roads in north Somerset, and the Black Dog, Bradford-on-Avon, Devizes, Melksham and Westbury Roads in west Wiltshire.

Although it has been possible to make a detailed analysis of the finances of only one body, it is likely that the practice of the Bath Trust was not exceptional within the region. The development of the institutional mortgage by attorneys was of high significance, because it allowed investment capital to be raised from disinterested small savers; helped fuel the growth of a primary and secondary regional capital market; and freed entrepreneurs from the need to tie up their own resources this way. The reward was a rate of interest whose movements were similar to those at the national level, but this may have been due less to the exertion of influence by the centre, than the operation of similar financial motives and conditions in the region.

The consideration of the more general question of the social rate of return to this investment is hampered by a lack of evidence on matters such as changes in transport costs, the generation of incomes for all associated with undertakings, and the widening of the market served. Tolls paid by road users provide the only accessible information and there are problems in their use, especially that of the degree to which increases in total revenue came from an extension of the rate rather than a growth of traffic. In Table 9(1) an asterisk marks the years in which tolls were changed, usually with an unpredictable effect on the total revenue of the Bath Trust. The extension of 1793 appears to have been less rewarding than that of 1810; that of 1829 was followed by a great reduction in the volume of tolls; whilst the changes following the General Act of 1822, which in one respect contracted the rates allowed by removing the right to weigh single blocks of stone, confounded the fears of the trustees by the ensuing increase in the total received⁵⁸. Extensions of toll were thus not without effect, but the revenue was probably increased more effectively by the growing use of the roads, which was one of the social returns to this investment.

The value of transport dues as indices of economic growth was demonstrated by Wilson, who showed the effect on those in the West Riding of the fluctuating fortunes of the local woollen industry⁵⁹. But for the Bath Trust the totals are an unsatisfactory instrument for economic analysis because in

general the use of the roads was more varied. Nevertheless, since passengers and goods were to some extent associated with particular routes, an examination of the revenue from different gates is of interest. In his analysis of building booms in the city Neale suggests a peak in 1769-70, breaking in 1770-71 because developers had over-estimated the growth of demand for houses⁶⁰. The returns at individual gates are available for this period and they do show some echo of this pattern, for there are signs of a decline in the coaches and waggons entering the city in 1771-2 (the London gate), followed by a fall in grain coming in (the Lansdown gate on the northern road from the vale of Gloucester) and a decline in the same years of stone from the southern quarries (the Claverton, Wells and new Wells gates) through the last two of which (plus the Marksbury gate) came coal from the north Somerset field⁶¹. The use of the roads by other traffic means that too much should not be read into these suggestions, but they may provide some evidence of the changing economic fortunes of Bath. The need for caution is underlined by Ward's attempt to relate the toll receipts of the Avon Navigation to demand in Bath, for the lower revenue of the 1770s and early 1780s may not have been due entirely to the fall in house building as he suggests, but to the dishonesty of treasurers already noted⁶².

Lastly there is the question of the management of the Trust, which had a great influence on investment in the roads. From about 1807 came the difficult years which led to a change from

gentlemanly control to that by salaried professionals. These events have already been described, but their interpretation remains a challenge, ~~especially as~~^{for} the trustees had survived similar difficulties before, especially in the years 1792 to 1801. Then they had met the cost of a renewal Act; two increases in the rate of interest; two wage increases; and faced the demands of six creditors for the repayment of sums totalling £8,350, emerging from all this with their executive authority intact. With economies such as dispensing with the surveyor for the eastern roads, and positive actions such as the appointment of a supervisor to keep a check on the gates, they had even been able to embark on the construction of a new line of road, the first land purchases for which were made in 1801, when the coming of easier times was confirmed by the reduction that year of carters' wages, the price of provisions having fallen⁶³.

In neither case was the chief problem falling revenue, for in the first period the tolls collected rose slightly from £6,786 in 1791 to around £7,000 at the turn of the century (the £7,415 of 1798 being a gross figure), whilst in the later difficult period they rose from £8,520 net in 1807 to nearly £11,000 in 1816. The rising cost of capital and labour was more serious, especially the latter, for it has been shown that the undertaking remained heavily dependent on manpower in these years. Any rise in grain prices was therefore serious for the Trust's economic well-being, but again this was a problem in

both times⁶⁴. Possibly the only advantage of the 1790s was that the trustees entered that decade with a balance of £1,147 in the treasurer's hands, whereas by 1808 they were much in need of subsidies from their newly appointed bankers⁶⁵. Apart from this it can only be suggested that the later difficulties were survived less successfully than the earlier ones because of failures of management and a loss of the entrepreneurial skills of resource allocation which made inevitable the employment of professionals. It may be no coincidence that a number of leading businessmen trustees died in the early 1800s and were succeeded by men without this experience. Jacob Mogg is a case in point for when he died in 1806 six of his family were trustees, but as clergymen, surgeons, and attorneys they lacked the entrepreneurial skills of their coal master progenitor, able by his choices to advance both public good and private profit. This chapter thus concludes by re-affirming the importance of the individuals committed to capital works in the region, and of the networks within which they operated in order to create developments in river, canal, and road transport.

- 1 1707/8, Roads leading into Bath, 6 Anne c.42; 1727, Roads leading into Bristol, 13 Geo.I c.12; 1711/12, River Avon Navigation, 10 Anne c.8.
- 2 1753, Wells, 26 Geo.II c.76; 1753, Shepton Mallet, 26 Geo.II c.35; 1757, Frome, 30 Geo.II c.39; 1768, Buckland Dinham (later Radstock), 8 Geo.III c.53; 1793, Harptree, 33 Geo.III c.165; 1752, Warminster & Frome (Black Dog), 25 Geo.II c.12; 1756, Bruton, 29 Geo.II c.50.
- 3 1756/7, Bath, 30 Geo.II c.67; 1748/9, Bristol, 22 Geo.II c.28.
- 4 Billingsley, Agriculture of Somerset, p.159.
- 5 1827, Wedmore, 7 & 8 Geo.IV c.5; 1748/9, Bristol, 22 Geo.II c.28; 1778/9, Bristol, 19 Geo.III c.116.
- 6 G.E.Farr, Somerset Harbours (1954); Graham Smith, Smuggling in the Bristol Channel 1700-1850 (Newbury, 1989).
- 7 1794, Kennet & Avon Canal, 34 Geo.III c.90; 1794, Somerset Coal Canal, 34 Geo.III c.86; 1796, Dorset & Som.Canal, 36 Geo.III c.47.
- 8 Latimer, Annals of Bristol, II, pp.94-5; T.S.Willan, 'Bath and the Navigation of the River Avon', Bath Branch, Proc.Som.Arch.Nat Hist.Soc. (1936), p.139-40; Kenneth R.Clew, Kennet & Avon Canal (Newton Abbot, 1968), pp.15-23; BGA, Council Book, vol.4, 1711-28, 17 June 1724.
- 9 Lists of subscribers in vol.1 of the Minutes & Reports of the Company, PRO, RAIL 805, 1724-27, have been checked against evidence gathered during research. See also F.V.Emery, 'Dr. John Lane of the Copper Industry at Swansea', Gower, XX (1969), pp.8-13.
- 10 Benjamin Boyce, The Benevolent Man (Harvard U.P., 1967), gives a useful account of Ralph Allen's life.
- 11 PRO, RAIL 805, Avon Navig.Min.Book, vol.1, 1 Jan.1724/5.
- 12 Ibid., 6 Sept.1725; Clew, Kennet & Avon, p.18.
- 13 Boyce, Benevolent Man, p.72 n.32.
- 14 Neale, Bath, Appendix A, pp.384-5.
- 15 Clew, Kennet & Avon, pp.21-2.
- 16 Latimer, Annals of Bristol, II, pp.498-9; Clew, Kennet & Avon, pp.38-78; J.R.Ward, 'Speculative Building at Bristol and Clifton', Bus.Hist., XX, 1 (1978), pp.3-18, and The Finance of Canal Building in Eighteenth-Century England (Oxford, 1974), pp.66-9, 92-4, 138-40.
- 17 Ward, Finance of Canal Building, pp.94, 188.

18 Clew, Somerset Coal Canal; SRO, Som.Coal Canal, misc.items: 30 June 1795, printed report of general meeting, naming committee appointed; 7 Dec.1799, printed report to proprietors.

19 SRO, Som.Coal Canal, misc.item: 17 Nov.1807, Chairman's report with financial statement annexed; Clew, Somerset Coal Canal(Newton Abbot,1970),p.80; Ward,Finance of Canal Building, pp.94 n.7, 178.

20 Clew,Dorset & Somerset Canal(Newton Abbot,1971),pp.55-63; registers compiled for region.

21 Charles Hadfield,Canals of South West England(Newton Abbot, 1967),pp.32-6; Brown,'Leisure Industries in the Bristol Region', pp.100-1; SRO, Q/RDe 129 (1813-19).

22 For an earlier version of this study see Buchanan,'English Turnpike Trusts',Econ.Hist.Rev.,XXXIX (1986), pp.223-43.

23 For good general accounts see William Albert,Turnpike Road System(Cambridge,1972) and Eric Pawson,Transport and Economy (1977).

24 Qualifications were set out in 30 Geo.II c.67 and re-phrased in the general Act, 3 Geo.IV c.126; Returns under 1 Geo.IV c.95 are held in SRO, Q/R Turnpike Trust Accounts 1822-50, which include the returns for 1820 here discussed.

25 SRO, D/T/ba, Min.Bk.8, Summary of Accounts 1770-6, 7 July 1787, 5 Nov.1791; Min.Bk.10, 20 Nov.1813; Q/R Turnpike Trust Returns for 1820; HLRO, HL Sess.Papers 81 & 24 (1833) cccxxiii, pp. 204-5, Returns for 1829.

26 Ginarlis,'Road and Waterway Investment',pp.28-36.

27 SRO, D/T/ba, Box 42, Deeds of mortgage, assignment, declaration etc. relating to mortgaging of tolls, 1758-1849; Min.Bks. 6-12, for years 1757-1854; 18, Register of Mortgages of Toll, 1760-82; 19, Register of Mortgages of Toll, 1801-16; 41, Lists of Creditors for 1785 and 1805.

28 SRO, D/T/ba, Acts of Parliament, Minute Books, and the 'Trustees' Subscription Book to Oaths of Qualification 1793-1851', combine to show that between 1757 and 1829, 1,612 men were elected as trustees, of whom only 781 (48%) qualified to act in that capacity, sometimes after a lapse of up to 20 years.

29 SRO, D/T/ba, Min.Bk.6, 26 June, 27 July, & 17 Aug.1759, 6 March & 10 April 1761.

30 SRO, D/T/ba, Min.Bk.6, 20 Feb.1761; Min.Bk.9, 7 June 1806. On his death his son George was 'requested to continue the Repairs of the High Littleton and Rush hill roads'.

31 They were: Alexander Adams, John Billingsley, John Bush, John Crang, William Crang, George Hodges, John James, George James, William Kelson, James Lansdown, Richard Lansdown, John Mogg, George Mogg, James Moore, Samborne Palmer, John Purnell, William Savage, William Savage jr., James Savage, James Stephens, and James Tooker.

32 In the Turnpike Road System, p.113, Albert had concluded that 'the greatest proportion of capital invested came from the landed classes - farmers, gentry and landowners'.

33 PRO, Chatham Papers 30/8 183 Part 1. Note to William Pitt from Lord John Thynne, enclosing letter from William Clark of Bath, 18 Oct.1804, on excise frauds by some fellow brewers. He claimed to 'employ the enormously commanding capital of upward of five pounds per Barrel', and to produce over 10,000 barrels per year, suggesting a capital of over £50,000.

34 Albert, Turnpike Road System, p.107.

35 Information on John Thomas comes from original sources used in this research, but see also, Anon., 'John Thomas of Bristol and the Kennet and Avon Canal', Jnl.Friends Hist.Soc., XVII (1920), pp.29-33.

36 The role of the attorney as 'an intermediary for inter-personal lending' has been explored by Anderson, 'The Attorney and the Early Capital Market' in Crouzet ed., Capital Formation, p.229, and their importance as 'go-betweens in directing money' into transport and public utility schemes has been briefly discussed by M.Miles, 'The Money Market', Bus.Hist., 23(1981), p.140. But the development by which attorneys came to operate the impersonal capital market here described, has so far been neglected.

37 BGA, Min.Bks. of Bath Corporation, and 'The Book of Account of the several Sums of Money borrowed by the Corporation of Bath, 1765-1803'; Neale, Bath, App.A, pp.384-90; McIntyre, 'Towns as Health and Pleasure Resorts', pp.443-6 and 'Rise of a Resort Town' in Clark ed., Country Towns, pp.226-7.

38 BGA, Min.Bks. of Bath Corporation, and 'The Account Book of the several Bonds made out in the nature of East India Bonds to the several Persons as within...1778-1803'; Order Books of the Improvement Commissioners, and 'The Bond Book of the Improvement Commissioners, 1789-1823'.

39 SRO, D/T/ba, Min.Bk.6, 21 July, 28 July, and 11 Oct.1757, 28 Nov.1760, 23 Oct.1761, 2 April and 17 Dec.1762, 13 April 1764.

40 BGA, Min.Bk.6 of Bath Corporation, 27 June 1757. Information on Bank of England stock and government securities is from L.S. Pressnell, 'The Rate of Interest in the Eighteenth Century' in Pressnell ed., Studies in the Industrial Revolution (1960),

pp.178-214 and Albert, Turnpike Road System, pp.120-31. See also T.S. Ashton, Economic Fluctuations in England (Oxford, 1959), pp. 86-8 and Tab.9, p.187, and An Economic History of England: the Eighteenth Century (1955), pp.27-8, Tab.XIII, p.251.

41 SRO, D/T/ba, Min.Bk.8, 5 Sept.1778, 2 Jan.1779, 2 Aug.1788 and 3 March 1792; Min.Bk.9, 6 July 1793 and 7 Jan.1797; Min.Bk.11, 6 Sept.1823. BGA, Min.Bk.11 of Bath Corporation 20 April 1792; Min.Bk.12, 20 March 1797; Min.Bk.14, 11 Nov.1822; Order Bk.of Improve. Commissioners, 15 June 1792, 26 July 1797, 31 Aug.1822.

42 Neale, Bath, pp.161, 167-8, and 384-97 (Apps. A and B).

43 P.G.M.Dickson, The Financial Revolution in England (1967), pp.297-303.

44 Feinstein, Domestic Capital Formation, pp.8-10.

45 SRO, D/T/ba, Min.Bk.9, 6 Feb.1796; Min.Bk.11, 23 Oct.1824 and 5 Nov.1825.

46 SRO, D/T/ba, Min.Bk.8, Summary of Accounts 1770-1776 and 5 Nov.1791; Min.Bk.11, 11 March 1826.

47 Albert, Turnpike Road System, pp.87-90, Appendix D pp.230-3.

48 SRO, D/T/ba, Min.Bk.10, 21 Nov. and 5 Dec.1812, provides an example of the problems. It was alleged that Messrs. Lucas & Reilly's Exeter Coach and Messrs Pickwick's Bath and London Coach had both been upset by bad roads.

49 SRO, D/T/ba, Min.Bk. 7 Feb.1807.

50 SRO, D/T/ba, Min.Bk. 10. 'Report of John Loudon M'Adam to the Commissioners for the care of the turn-pike roads round the city of Bath', interleaved 1 Feb.1817.

51 SRO, D/T/ba, Min.Bk.10, 15 March 1817.

52 Benjamin Wingrove, Remarks on a bill now before Parliament for regulating turnpike roads; in which are introduced strictures on the opinions of Mr.McAdam, copy in BaRL.

53 Albert, Turnpike Road System, pp.142-8.

54 SRO, Min.Bk.11, 7 June 1823, 24 Dec.1825, 14 and 28 Jan. and 25 Feb.1826.

55 W.J.Reader, Macadam, The McAdam Family and the Turnpike Roads, 1798-1861 (1980); Roy Devereux, John Loudon McAdam (Oxford, 1936).

56 Keith Brace, Portrait of Bristol (1971), p.35.

57 Reader, Macadam, pp.56-8.

58 SRO, D/T/ba, Min.Bk.11, 15 May 1824. An increase of £620 was reported, which could have been £1,589 but for the general Act.

59 R.G.Wilson, 'Transport Dues as Indices of Economic Growth', Econ.Hist.Rev., 2nd ser.XIX,1(1966), pp.110-23.

60 R.S.Neale, 'Society, Belief, and the Building of Bath', in Chalklin & Havinden eds., Rural Change and Urban Growth, pp.266-7

61 SRO, D/T/ba, Min.Bk.8, Summary of Accounts 1770-1776.

62 Ward, 'Investment in Canals and House-building', pp.183-4; Clew, Kennet & Avon Canal, pp.15-23.

63 SRO, D/T/ba, Min.Bk.9, 6 July 1793, 15 Feb.1794, 4 June 1796, 7 Jan. and 4 March 1797, 6 Jan.1798, 5 Jan.and 7 Dec.1799, 7 March and 6 June 1801.

64 A.D.Gayer, W.W.Rostow & A.J.Schwartz, Growth and Fluctuations of the British Economy, 1790-1850 (Oxford, 1953), pp.27, 61, 63, 83, 140. Wheat prices began to rise late in 1794 and then increased greatly in 1795, falling in 1796. They rose again in 1799, falling from March 1801 to March 1804. With a deficient harvest in the latter year prices rose again, sagging from the close of 1806 to 1807 but then rising steadily to a peak in March 1809. After some fluctuations prices had by 1812 reached their highest point since 1801. From the end of 1813 they then fell, reaching a low point in March 1816. After a rise to June 1817 they then fell irregularly to Sept.1822.

65 SRO, D/T.ba, Min.Bk.9, 7 Sept.1793. Messrs Clement & Tugwell were appointed bankers 24 Dec.1808 and made several loans to the trustees, for example of £1,000 on 2 Dec.1809.

Part IV Conclusion : Capital Investment in North Somerset

Chapter 10 The Process of Capital Investment in North Somerset,
1750-1830

This study has been concerned with the process of investment, a subject which has received little attention in work on capital formation where the emphasis has been on measurement rather than explanation. It has been argued that such a stress is regrettable because the documentary evidence relating especially to the crucial years of the British industrial revolution is too insubstantial to bear interpretation by the quantitative method alone, and because such an approach hides the regional and sectoral changes which were so important in the early stages of industrialization. It is in any case unacceptable that this concept should be viewed in aggregative terms alone, for it also has a narrative dimension which is concerned with interpreting the course and procedures of capital formation. In an attempt to remedy the deficiencies of the 'mainstream' approach, the process of investment has here been studied through an analysis of the sources and productive employment of capital in the region in the years 1750 to 1830.

The difficulties of an historical approach are readily acknowledged, especially those arising from a paucity of primary material of a sufficient standard of continuity for a sustained analysis of capital investment over time. But this

problem and that of generalizing from possibly untypical evidence is likely to be no greater than that faced in the aggregation of data on a statistical basis, and the extent of the generalization will remain clear. The fact that much of the surviving material is not in a form capable of yielding easily the information being sought calls for an ingenuity which can produce new insights, into for example the importance of land sales as a way of financing enclosure of the waste and the effect this may have on costs, and of the institutional mortgage deed as a means of recruiting funds from small savers and the secondary market to which this may give rise. The constraints of timing also have some compensations, for although this study begins in the mid-eighteenth century in part because the evidence required starts to accumulate from that time, signs of an earlier economic activity may be found amongst this later material. For example the balance sheets of the Woolley powder mills can be consulted from the later 1740s, but partnership papers show that the works were founded in the 1720s. Evidence on other manufacturing and mining concerns also suggests the importance of the 1720s and 1730s in this region, especially as these years saw the founding of the Bristol Turnpike Trust (1727) and the construction of a tramway (1731) for the transport of Bath stone to the newly navigable River Avon(1727). These references suggest that a stage of readiness for more rapid economic development was by then being reached.

The geographical and historical context of the region are an integral part of this thesis, and not just a formal background. It has been argued that Somerset had long been regarded as a rich and populous county, with the prosperity of the northern third resting on agriculture, mining, and manufacture, and its population living in a broad scattering of villages in the region as well as in towns like Bath and Wells. But there were tensions within this apparently settled society, as was shown by an examination of the successive Commissions of the Peace which were so strongly imbued with the sense of status. The Pouletts may have been the only resident noble family throughout the period, but their influence and that of others charged with the stability of the county meant that representatives of the changing economic order like business men and attorneys were long excluded from the Bench, which was chiefly reserved for country gentlemen of independent means. But contrary influences were building up, partly because in north Somerset many of the resident governing gentry were becoming engaged in the promotion of mining and manufacture, partly because in the separately administered boroughs like Bath businessmen were already in positions of authority, and partly because of the number of successful Bristol merchants who had established themselves as landowners in the region. A systematic study of a number of different sources, including contemporary writers and research on charities, has enabled these links with Bristol to be established to a degree not previously recognized. The appointment of self-made men to the Somerset Bench (especially

after the turn of the century in view of the problems posed by a growing and sometimes restive population), marked a move away from formality and conservatism towards individuality and enterprise which helped reinforce the entrepreneurial spirit already found in many of the gentry and townsfolk. And at the very least, civil order, a pre-requisite for investment, was maintained.

Within this society the idea of progress and the spirit of improvement began to take root, especially as institutionalized in the Bath and West Agricultural Society, founded in 1777 and widely supported as its membership lists and journals show. It provided a forum for the gentry, clergy, and men of science and medicine, as well as for activists such as John Billingsley who rose from humble dissenting origins to become a clothier, landowner, canal and coal proprietor, and public servant in many offices as well as writing the county report to the Board of Agriculture. It is because of this involvement with so many aspects of the region's economy that it has been possible to place great weight on Billingsley's writings. But he was only one of many activists as the lists of commissioners and trustees compiled in the course of this research show. Such men are not usually thought of as 'enabling agents' in the process of capital investment, that term being more commonly reserved for financial intermediaries like attorneys and bankers. But the evidence from north Somerset suggests that in view of their function in matters like enclosures, when in fulfilling their

commission they also provided a channel through which funds could flow, this description could be extended to include them. Similarly, the exercise of their skills in public ventures like the turnpike roads can be termed entrepreneurial although their private funds were not placed at risk. Again, this may seem an unwarranted extension of the meaning of a term, but crucial choices involving the allocation of scarce resources amounting to large capital sums were made over this period by busy men like Jacob Mogg, investing time in undertakings from which the returns would be to both private gain and public good.

It can be argued that this spending of time on the creation and management of public works delayed the advent of the professional in this region, especially in relation to the labour intensive turnpike roads where the expertise of the trustees appeared adequate until the early nineteenth century. Even the surveying and engineering skills needed in coal mining, canal building, and drainage schemes were not employed until the 1790s, and then perhaps only because these developed from the estate surveying with which the gentlemen amateurs were familiar. Some of the professionals then came to spend their whole career in the region, like William White of Wedmore and Young Sturge of Bristol, whilst others like William Jessop and John Rennie were brought in as outside consultants. The most consciously professional of the early civil engineers was J.L.McAdam, active in the area after his appointment to the Bristol Trust in 1816. The shift from the control of roadmaking

by gentlemen to that by professionals was doubly important because it led not only to the introduction of better techniques but also to an improved estimation of costs, so that sound investment decisions could be made. Indeed engineers such as McAdam so prided themselves on the effective utilization of the capital employed, that for them the professional began to border on the executive function.

Exhibiting a similar duality of status were the managers of undertakings. The coal mines of the region customarily had a managing partner, who was likely to have started as a miner and become a working proprietor. One result of this was that unlike most other coalfields, both fixed and circulating capital were here provided by the partners. The Woolley powder works also had a production manager, but the importance of the trade through Bristol made it necessary to have a marketing manager there too. Although receiving annual remuneration both were partners, unlike the position with the Percival Copper Co. in the 1760s. They employed a salaried site manager, susceptible to discipline if his efficiency were called into question, and clearly expected to minimise costs rather than maximise production as a dispute in the early 1760s showed.

In contrast to these still-emerging professions were the attorneys, long established in Somerset and Bristol where two of the earliest law societies were formed. An analysis of the Law Lists has for the first time allowed their numbers and

distribution within this (or any) region to be established, and their early specialization within the port of Bristol to be established. It matters little that few personal documents have survived, for the evidence of their activities abounds in the leases, agreements, minute books, and official correspondence relating to the individuals and institutions they served.

Their importance depended in general upon the devising of an appropriate legal framework within which bodies could operate, referred to later, and in particular upon the development of the mortgage as a financial instrument through which savings could be channelled to investors. The raising of funds on the security of land was a long-established way of easing financial constraints but even when this was extended to land including paper mills as at Dulcote, it is likely that these transactions continued to take place within a personal market in which the needs of their clients were matched. But from at least the mid-eighteenth century the importance of attorneys in north Somerset extended beyond this, for they promoted the growth of an impersonal capital market by what has here been described as an institutional mortgage, as funds were recruited from unknown clients for investment in public utilities through advertisements on turnpike gates and later in newspapers. This helped the building of the infrastructure and also led to the growth of a local securities market, for these instruments were in small easily sold units. The volume of transactions and the number of deeds held for short periods suggest that this financial market may have performed a quasi-banking function.

Although the banking system in Bristol and north Somerset was becoming well-established in the second half of the eighteenth century, not only were the needs of small savers neglected but there was also little contact with most of the major economic developments in the region. Until the turn of the century the role of treasurer or banker in both limited schemes like enclosures and longer undertakings like the turnpike roads was performed by voluntary amateurs. It may be that at this time banks were not well-placed to fulfil this function because although large sums were involved on a cumulative basis, daily transactions were small and local, and took place within a well-established network of contacts in the region. The limited involvement by banks stands in contrast to that of attorneys, perhaps because so few of the latter went on to contribute their expertise to banking, as can be shown from the lists of bankers which have been drawn up for the first time for this region and Bristol. Banks in Bath were to a large extent concerned with servicing visitors to the spa, and with some risky speculations which were their undoing. The merchanting background of many Bristol bankers not only gave more stability and stronger roots, it also provided contacts with manufacturing concerns, especially those working on sites in north Somerset to which bankers as both private individuals and as partners in their institutions were able to give short-term financial help.

Within the complex structure of the region here described, the inter-action of gentry, merchants, town and country folk,

attorneys, and bankers in the processes of capital investment has been studied in a number of cases drawn from agriculture, mining, manufacture, and transport. But so intricately enmeshed are these procedures and so peculiar the individual instances, that generalization proves difficult. In the matter of the sources of capital for example it might seem appropriate to begin by eliminating the nobility, for the most significant contribution of a peer like Lord Poulett was to the maintenance of a stable society within which individual interests could be pursued. But this is to ignore the role of archaic figures like the four Lords Royal, committed to providing the fixed capital employed at the lead and calamine mineries. As representatives of the old order they and their counterparts the free miners stood at one end of a range of sources of capital at the other end of which were the independent Bristol merchant capitalists involved in the manufacture of for example copper, brass, glass, and gunpowder. But their success may have come to depend less on their continuing entrepreneurial skills as expressed in risk taking and the allocation of scarce resources, than on the earlier decision to exploit the links between the port with its trading facilities, and the hinterland with its waterpower and labour. In between were the coal masters, many of them gentry living within the region, whose resources they exploited on an entrepreneurial basis as mining rights were leased from land-owners. Decisions had to be made about which mines to open up, and how long to continue investing capital in yet-unrewarding pits as at Farrington. The problem of land-locked mines led to

support for the Somerset Coal Canal, and an allocation of capital and time to this venture which yielded direct financial as well as indirect business returns through the enlargement of the market. It should be stressed that these and other entrepreneurs rarely acted alone, preferring to share both capital provision and risk taking, usually in partnerships established by legal articles. The interlocking partnerships of the coal-masters were particularly important for they allowed the costs of new ventures to be offset by the profits of established pits in a way never achieved by the free lead and calamine miners. The number of partners ranged from three at Farrington Pit in the 1780s to 14 at the Percival Copper Co. in the 1760s. The resolve of the latter to limit the number of shares held suggests a wish to prevent an accumulation of power in few hands, though a contrary move at Woolley inspired by the high returns to capital, reduced the number of partners there.

The investment opportunities for surplus capital provided by these private networks were supplemented at this time by a number of new and specific outlets in the region, created through the legal provisions authorizing various undertakings, which had the effect of providing outlets for a wider range of savers than would otherwise have been the case. Parliamentary enclosure for example was financed by the compulsory sale of land which permitted investment ranging from the small-scale by countrymen eager to consolidate existing farms, to the larger-scale aimed at creating new ones. A classification of those

concerned in each enclosure showed that almost half buying land were yeoman farmers, whilst others ranged from peers and gentry to small savers such as innkeepers. The system, which enacted an economic cost on those receiving an allotment, also allowed speculation in land suitable for house building especially in developing coastal resorts. Fewer opportunities for outsiders to invest were offered by the rate-financed drainage schemes which exacted an enforced saving, but these are of interest for the way that the responsibility for this provision of fixed capital was allocated between landlords and tenants. Further specific linkages created in these years enabled small savings to be channelled into particular outlets through the risk-free and marketable institutional mortgages offered by the turnpike trustees and improvement commissioners. This was of particular importance for these appointees rarely made a financial investment themselves, perhaps because as manufacturers or landowners they had better alternative uses for their funds. But an opportunity was thus created for the investment of the small savings of for example lodging house keepers or craftsmen, who would otherwise not have had this choice available to them.

The importance of creating appropriate legal entities for the handling of funds and formation of assets should also be noted. In public matters this often took the form of a body charged with a specific task, of which Enclosure and Improvement Commissions provide examples. Their members were authorized by law to raise capital for public investment by selling land or

property in which a range of interests existed. Established earlier but with less specific though continuing powers the Courts of Sewers lacked the confidence that their commission extended to the authorization and funding of large scale new works. Despite the re-assurance of counsel that if an orderly procedure were followed no penalties would be incurred, the Courts preferred not to embark on new work for which the proprietors had no traditional obligations. New Acts of Parliament setting up Drainage Commissions with the powers to achieve certain objectives were therefore sought. The way these issues were settled throws new light on the changing relationship between such bodies and their legal advisers, for it can be argued from these cases that public activities in the provinces came to be based less upon the opinion of London barristers and more upon legislation drafted by local attorneys in consultation with Parliamentary lawyers, who were dependent upon them for a considerable part of their business.

Like the Enclosure, Drainage, and Improvement Commissioners, the Turnpike Trustees were also empowered to raise funds for new investment, but they then became trustees of the works created. The adaptation of this concept from the land law was of immense importance because it meant that public capital investment could be undertaken without private assets being placed at risk, over the years, and not as in the other cases until a certain limited objective had been achieved. Lastly, the view as to what constituted an appropriate legal entity

might change. Thus the joint stock Bristol Brass Company was felt to have become so unwieldy by the 1780s that it was re-formed as a partnership, although it had earlier been able to recruit capital from a larger number of shareholders than a partnership could ever rival. This move was made possible by the partners' ability to supplement the new capital from their private funds, and to secure loans from outside sources.

The pattern of linkages here described shows the complexity of the relationship between the sources and employment of capital. It also reveals an imperfect capital market, which would seem to be unfruitful ground in which to look for example for movements between agricultural profits and investment in transport. But what can be shown instead is that individuals took advantage of the opportunities presented to them, as when landowners shared in the development of mineral resources, coalmasters invested in the coal canal, and commissioners bought land auctioned at enclosures they were executing. Evidence is limited but it appears that changes in financial returns alone were rarely enough to attract funds from other uses. Thus although the continuing investment in coal mining, canals, and enclosures in the 1790s suggests no overall shortage of capital, yet savings were not forthcoming for the Bath Turnpike Trust in the years after 1793 until 1801, despite the raising of the rate offered from 4.0 to 4.5 per cent in 1793 and to 5.0 per cent in 1797. For the several manufacturing concerns studied the position was more open, because these were

an important outlet for the surplus funds of Bristol merchants, operating within a network of personal and professional contacts able to facilitate capital investment.

On the matter of the importance of the long-term metropolitan rate of interest as both an indicator of financial conditions in the provinces and a significant factor in the timing of investment, it has already been observed on the first point that the similarity of movement between the London and Bath rates may be explained in terms of the economic conditions affecting both, and the activity of urban investors seeking a financial rather than an economic return. Scattered evidence from land and property mortgages within the region suggests in this respect the importance of convention, lower interest rates being paid as long as custom prevailed. On the question of the relationship between the rate of interest and the undertaking of capital works it can be said that these were embarked upon in response to physical pressures (drainage, and to some extent the roads), and conditions of demand as reflected in prices (enclosures, coal mining, and coal canal), and that delays were more likely to be due to administrative uncertainties (drainage) than to a shortage of funds. There appears to have been little connection between lower rates and the undertaking of capital works, and indeed for bodies such as the Bath Trust the association was between investment and the paying of a higher interest rate.

The difficulty of drawing conclusions about the employment of capital is great, for unlike the rate of interest or the legal form, this must be considered in the light of conventions which are anachronistic and so difficult to apply. The study of the distribution of costs has been pursued where possible for undertakings, and this analysis has revealed the difficulty of allocation. For example, to make drainage schemes effective land had to be purchased and damages paid, whilst in road making some building material costs concealed a labour charge. Indeed the labour-intensity of much construction in these years poses its own problems. Despite this it is worth considering the annual increments to capital stock, for the purposes of comparison within the region. The impact of Parliamentary enclosure and drainage has been assessed on the basis of an estimation of the original capital stock (through a capitalization of the rents of land affected, from Billingsley's estimates made in the mid-1790s, and according to the known proportions of the different types of land concerned). For the Bath Trust the estimate of original value has been based on the capital investment authorized before the 1750s. The annual accounts of the Woolley and Harford works provide evidence on the value of the fixed capital as estimated by the partners. Information on mining is least satisfactory for although to a greater extent than with manufacturing, investment at Farrington was part of a growing capital stock in the industry in the region, it is difficult to know how typical the procedures were. The volume of investment over the years has been estimated from

the tables compiled, in full awareness of problems made clear by evidence on the distribution of costs, such as that not all investment was equally productive of new physical stock.

From these and other qualifications it will be clear that only the most tentative generalizations can be made. After a high initial rate for the Bath Trust in the 1750s the annual rate of increase over the whole period until 1830 was 4.4 per cent. The highest rates came in the second and third decades of the nineteenth century, being associated with the activities of Wingrove at 5.8 per cent, and McAdam at 7.8 per cent respectively. Investment in the roads was at its lowest rate of 0.7 per cent between 1793 and 1801, when agricultural investment through enclosures was showing an increase which was sustained in the following decade through the drainage schemes. If an allowance is made for farm creation on the lines suggested by Billingsley, then to the annual rate for the years concerned of 0.7 per cent for enclosure and 1.0 per cent for drainage schemes, may be added an annual increment of about 3.0 per cent, bringing the overall rate closer to that for the roads. Information on mining and manufacture is very limited but it seems unlikely that the annual rate of increase (at the Woolley works over the years 1746 to 1801 for example it averaged only 1.1 per cent), was as great as that for farming or road transport. This may indicate either the greater importance of developments in the basic infrastructure, or the lower annual increments through which industrial activity could

be sustained. In the longer term however manufacturing in this region was penalized by the failure to introduce the new techniques and equipment which would have encouraged its diversification and growth.

The relationship between fixed and circulating capital can only be satisfactorily studied for the manufacturing concerns. Much of the investment in agriculture, transport and the public utilities was in the form of fixed capital, and to a lesser extent this was true also of mining, for in the absence of large raw material requirements, and with much of the sale of lead, calamine, and coal being from the mineries and pitheads, the financing of stocks and stores was much less important than with industry. Very little relevant material has been found on the making of woollen cloth, but at least its organization on a putting-out basis, especially before the introduction of spinning mills from the 1790s, suggests that circulating capital was likely to have had an importance relative to fixed capital which would distinguish this form of manufacture from that of factories in the region. But such a generalization is hard to sustain because these proportions varied so greatly in the undertakings studied. At the old Bristol Brass Co. for example raw material stocks were generally so high that in the years 1779 to 1784 fixed capital represented only 12 per cent of the combined assets. Yet at the Woolley powder works which also carried large stocks and stores because of its widespread network of suppliers and customers at home and overseas, this

proportion was the much higher 37 per cent, a calculation based on the years when the position was not confused by the absorption of some of the powder stores into the trade credit figures. Perhaps the fixed capital embodied in some water-powered mills was of greater significance relative to circulating capital than generally thought, and if this was the case for the powder mills it was probably even more true for the grain and paper mills of the region whose trade was more local. Factory organization was also influential, for the circulating capital requirements of a firm like the Percival & Copper Co. were increased by the scattered nature of its works.

An attempt was made earlier to assess the profitability of the capital employed in manufacturing concerns, and despite the many difficulties it is worth returning to the subject for the question it prompts of whether there was some optimal point in the relationship between fixed and circulating capital which was most likely to promote an efficient use of the physical assets. Evidence is limited and enterprises are in any case likely to have had different 'ideal' positions because of variations in the cost and supply of raw materials and in conditions of sale. Nevertheless it may be suggested that at the Woolley Works where the fixed capital formed one-third or more of the assets this ratio was too high for the most efficient use of capital, a conclusion the partners had reached by the end of the eighteenth century when they decided their productive capacity was too great, despite the fact that

profits were not adversely affected as long as market conditions were favourable. At the old Bristol Brass Co. where fixed capital was little more than one-tenth of the assets this proportion was too low for either capital efficiency or returns to capital invested. At the re-formed Harford's Bristol Brass Co. however, where fixed capital was one-fifth to one-quarter of total inventory assets (the new partners having taken immediate steps to slim down stocks in the later 1780s), then this proportion was one likely to promote efficiency as judged by the profitability of the capital employed. In other sectors this may be revealed in ways which go beyond the limited scope of this research, through for example increased productivity in agriculture, or social returns to transport developments.

In studying the relationship between capital investment and economic change in north Somerset, the pattern which emerges is that of two levels of economic activity in these years: first, the general internal developments which may be termed land- or resource-based, and second, the externally financed manufacturing enclaves which may be termed capital- or trade-based. The former include the enclosure, drainage, mining, river, canal, and road transport undertakings, all related to local needs and mostly financed from within the region. On the whole these were large in structure, but the capital input was either built up slowly (mining and farm making), compiled from small separate contributions (turnpike mortgages, canal shares, drainage rates), or even realized by the sale of assets

(enclosures). Although one of these spheres of investment (agriculture) was perhaps as profitable as those at the second level and another (the coal canal) was certainly so, returns were generally lower because of the need to offset gains by losses (mining) and through limits on the institutional rate (turnpike trusts and improvement commission). There is no evidence that banks played a role of importance in these undertakings until the end of the eighteenth century. Loans enabling enclosure schemes to get underway came from the local gentry and clergy, and turnpike finances were handled by trustees, for example wine or linen merchants. There was a network of local suppliers, for example of candles and gunpowder for the mines, but there is no evidence that credit was an important factor in their operation and indeed surviving accounts show the regular settlement of debts. This may have been because as studies of the distribution of costs showed, the undertakings in this first group were labour rather than capital intensive, and although the end product was a significant item of fixed capital (a mine or a new road), there were long periods of construction during which wages and other small payments had to be made.

The manufacturing ventures at the second level of economic activity (gunpowder, copper, brass, and glassmaking) were not themselves necessarily large in scale, but they were part of an extensive network of foreign and coast-wise trade, credit facilities, merchant capital, and banking support, centring on

the port of Bristol. To the merchants of that city north Somerset offered scope for investment and expansion on accessible, water-powered rural sites. There were of course other, longer-established manufacturing concerns in the region (woollen textiles, paper making, pottery, brewing, distilling, and iron founding), but apart from the first these are to be classified with resource-based developments, using local capital and supplying largely local customers, rather than as part of Bristol's shipping and credit network. It is unfortunate that there is little surviving evidence about them to suggest exceptions to this generalization, but perhaps the very fact that the records of local paper makers or iron masters were less likely to survive than those kept by Bristol entrepreneurs engaged in a wide range of overseas ventures, may serve as a further indication of the distinction here being drawn. In the case of the woollen industry classification is more difficult, but to regard it as capital- or trade- rather than resource-based seems appropriate. This is because although in the period under consideration English wool was still widely used, and the home market was gaining an increasing precedence, yet foreign (chiefly Spanish) wool continued to be of great importance in a system of manufacture which was enmeshed within a network of international trade, and which was controlled by capitalist clothiers through their financing of both the domestic and factory stages of production. Indeed the fact that in the mid-fourteenth century this industry began to move from its manufacturing and trading base in the port of Bristol, into

the countryside in search of water power and a freedom from restrictions, makes it a forerunner of the pattern here being described for later years.

One sector which has received less attention than it deserves in this study is that of building, especially of houses. But this is a subject in which primary evidence has proved hard to come by, and Somerset's earlier high ranking in terms of population numbers and density, and the later absence of great industrial concentrations, combine to suggest that the growing population may have been housed within the existing stock, as well as in locally financed developments, of for example housing for miners in Radstock by the Waldegraves, and for glassworkers in Nailsea by J.R.Lucas. Since larger-scale projects were also developed by local initiative, for example at Weston-super-Mare by the Smyth-Piggots and at Clevedon by the Eltons, then residential building may in general be accommodated within the proposed analysis. There remains the problem of Bath, where the importance of aristocratic entrepreneurs like the Duke of Chandos and the Earl of Bath, and of the great web of credit involving builders, attorneys, and bankers, has been revealed by the research of Chalklin and Neale. The city provided an economic stimulus to northeast Somerset as a market for food, coal, and stone, but made little reciprocal investment in the region. Men like Walter Wiltshire who had made a fortune as a carrier bought nearby estates and built great houses, but the focus of attention remained the

city and its links with the metropolis rather than with the countryside. Since its connections with Bristol remained tenuous its buildings may be seen from the point of view of this analysis as land-based, but financed through links with London as well as from within Bath.

The reasons for the land- or resource-based developments lie largely within the region itself and have been fully rehearsed in the earlier chapters which dealt with its agricultural, mining and manufacturing possibilities; its relatively large and growing population; the stability of its settlement patterns and social structure (especially its broadly based gentry of whom many were committed to the development of its resources); its active enthusiasts for improvement; and the early development of its legal and banking systems, particularly the former.

In seeking reasons for the presence of trade-based manufacturing enclaves in north Somerset it may not be necessary to look beyond the difficulties of industrial expansion within Bristol and the opportunities provided by accessible rural locations offering water power and a labour force. But it is of interest to consider other factors which may have influenced both the nature of this investment and its timing, for it was particularly noticeable in the decades from the 1720s and again in the 1780s. An explanation for the earlier years may be sought in 'peculiar' factors outside the

traditional pattern of commerce, for Bristol became involved in the slave trade in the eighteenth century, and was indeed the leading English port from the 1720s to the early 1740s when it was overtaken by Liverpool. It is not appropriate to embark on the vexed question of slave trade profits now, other than to note that their scaling down by Roger Anstey to a possible return of 10 per cent¹, was based on evidence from the second part of the eighteenth century and not from the period of Bristol's dominance when smaller ships carrying possibly more slaves per ton than the later better-regulated vessels, although with smaller outset costs, may have made more profitable voyages than was later the case, especially as the prices fetched may on the evidence available have compared well with the average for the times².

To concentrate on these profits alone is however to proceed on too narrow a front, for as well as providing Bristol merchants with surplus funds, the Africa trade also stimulated economic development by the market it offered for manufactured goods throughout the eighteenth century. Accounts, inventories, and correspondence all provide evidence of production for this special outlet, as was shown for example by the distinction made by gunpowder makers between Guinea powder for the Africa trade and Merchant powder for other customers, and by the Guinea manillas, rods, kettles, and 'Neptune' pans, produced by brass and copper manufacturers. Clues to the importance of this market lie in the Bristol Port Books which have been culled by

David Richardson for evidence on the Africa trade between 1698 and 1769³, and in the Bristol Presentments for the later period of 1773 to the 1790s⁴, from which I have gathered material whose analysis is still proceeding. All this evidence confirms the importance of the trade for manufacturing firms in north Somerset in these years. Cargoes were assembled with care to meet the demands of traders in West Africa, and along with the cottons, cowries, iron bars, glass beads and strong liquor, the barter goods regularly included gunpowder and brass and copper ware to the extent of one-quarter to one-third in value of the whole where such an estimation can be made⁵.

An association between the profits of the Africa trade and investment in north Somerset through the actions of individuals concerned is not easily demonstrated, especially as unlike London or Liverpool the operation of this trade in Bristol was not concentrated in the hands of a few easily identifiable merchants, but more widely dispersed in changing partnerships. However in the course of this study, particularly in the chapter on manufacturing, the connection between the two has been established at all available opportunities, on the basis of a cross-referencing between the registers of interests and activities drawn up for the region. In more general terms it can be argued that under this stimulus there developed an interlocking network of interests involving the port of Bristol, the Africa trade, the trans-Atlantic plantations, and manufacturing sites in north Somerset, in a relationship which

was largely dependent on that city for the provision of capital and credit, shipping, raw materials, and markets. These links were facilitated by the close relationship between Bristol and north Somerset on such levels as landowning, which not only familiarized merchants with conditions in the countryside, but also meant that on occasions they already owned or could easily rent the sites where manufacturing ventures were planned.

That the experience of this region was not singular may be seen from Eric William's general survey⁶, and from particular accounts like that by Pierre Boule of the French port of Nantes⁷. The latter suggests that the demands of the slave traders for goods with which to purchase slaves, coupled with the availability of capital from the trade, led to the industrial development of the region from 1730 to the 1750s. But growth was curtailed in the short run by the setback to trade of the Seven Years War and in the long run by the isolation of Nantes. Bristol's dominance was also lost by the mid-century, and although its economy was too broadly based for it to suffer a general decline, its commerce continued to be upset by wars in the eighteenth century, particularly that for American Independence when shipping faced the problems of privateering and a loss of markets. It may have been these uncertainties in trade which helped to increase interest in manufacturing in north Somerset in the 1780s, despite the fact that for the Quaker Harfords their take-over of the old Brass Wire & Copper Co. increased their stake in a firm whose

prosperity lay in part in the manufacture of barter goods for the Guinea Coast.

The circumstances of this business manoeuvre can be studied in Edward Harford's ledgers, which show that the investment in the new Brass Co. partnership was preceded by a withdrawal from trade, so that the revenue from that source which in 1780 had formed 33 per cent of the whole, had by 1786 dropped to 16 per cent, before falling away entirely thereafter. Compensation came from interest and dividends, and by 1798 this deficiency had been fully overcome. In addition to the returns from the new partnership there were those from other industrial investments (some in South Wales), from loans to industrial and merchanting partnerships, mortgages, and holdings of Government stock, and from rents⁸. Like most of the other Bristol merchants, manufacturers, and bankers encountered in this research, Edward Harford acquired or inherited landed estates in the countryside, but like them he did not thereby become cut off from the active life of the city and its port.

In conclusion, what was the influence of the two levels of capital investment on the course of economic change in the region? It may be suggested that the effect of the trade-based undertakings was first to help stimulate but then to retard the course of development. As noted, many of the essential pre-conditions for growth were present in north Somerset in the first half of the eighteenth century - a settled social and

economic framework in a traditionally wealthy and populous county, a growing domestic market, an active body of lawyers, and a large number of gentlemen willing to combine public duty with private interest. In this context the enterprises financed by merchant capital are likely to have been for much of the period an additional factor for change, perhaps stimulating the development of an infrastructure, especially a road network, greater than was otherwise warranted. The quickening of economic activity was however chiefly in traditional areas such as agriculture, mining, and transport, and with the failure of the trade-based industries to develop backward and forward linkages, the decline of the land-based industries such as paper making, and the lack of great natural resources, north Somerset never achieved the self-sustaining growth of another region of Bristol activity, south Wales. This suggests that ~~it~~ it was not the Bristol link as such which came to inhibit development but the fact that the manufacturing ventures remained part of the merchanting network instead of becoming agents of industrialization.

The woollen industry may be referred to at this point in the argument since the taking up of slack rural labour by putting-out clothiers producing for external markets in a region of increasingly commercialized agriculture could, in terms of the idea of proto-industrialization, have helped foster the move from a traditional rural culture to a factory-based industrial society. This change came close to realization, for despite the

sometimes violently expressed opposition of workers to the introduction of machinery from the 1770s on, there was a growing concentration of production in water- and later steam-powered factories in the east of the region, especially from the 1790s in Frome, Shepton Mallet, and Twerton. But despite individual successes the industry declined in the nineteenth century, perhaps due to entrepreneurial deficiencies shown by the failure to persist with the introduction of machinery before the 1790s, to secure the better transport needed for improved coal supplies, and to match the determined salesmanship of the West Riding of Yorkshire⁹. But this decline must be seen not only in relation to outside competitors, but also to the changing fortunes of the region. In that context the woollen industry may be seen as part of the pattern whereby the manufacturing enclaves re-inforced rather than challenged the traditional society, which therefore failed to undergo the structural changes necessary for sustained economic growth. The result was that most manufacturing petered out in the course of the nineteenth century and the region reverted to its resource-based economy, largely agriculture, coal mining, and quarrying.

As an example of capital formation in a regional economy north Somerset cannot be counted a success story. Nevertheless the study of its growth experience is important, as part of the pattern of change making up the national economy, and because it illuminates several themes of current importance, including the structure of capital during the industrial revolution,

'withered enclaves' and de-industrialization, and 'gentlemanly' capitalism¹⁰. The distinction between profit and interest, and the role of women and Quakers in capital investment all merit further research. Even more important than these justifications however, it is the contention of this thesis that the subject of capital formation can only be fully understood within the context of the historical dimension as revealed by empirical studies. Through the reconstitution of data on capital investment and the identification of the sources and procedures by which this took place, the basis of some of the accepted generalizations on capital formation may be questioned and the process itself analysed and explained. It is realized there are problems in this strategy, ranging from practical difficulties like that of generalizing satisfactorily from limited evidence, to the major philosophical danger that the work will be judged, not on its own terms but as some failed attempt at aggregation. But it has been a main aim of this thesis to try to overcome the narrowness of that approach, by a broad concern with the whole matrix of the subject in its historical context, in order to arrive at an understanding of the process of investment as the active element in capital formation. Not least, this integrated approach may lead to an improvement in the conceptual understanding of and theoretical approach to the whole subject.

1 Roger Anstey, The Atlantic Slave Trade and British Abolition 1760-1810 (1975), pp.45-8.

2 For example, letters from Isaac Hobhouse and his partner Onesiphorous Tyndall (with their copper, gunpowder, and banking

connections) to their trans-Atlantic agent show that on five voyages in the later 1720s the average selling price of slaves was at £27, £3 per head greater than that suggested by Stanley Engerman, 'The Slave Trade and British Capital Formation in the Eighteenth Century', Bus.Hist.Rev., XLVI(1972), p.438. BRL, Jefferies Collection, Hobhouse Papers, vol.13. Also, Latimer, Annals of Bristol, pp.142-7.

3 David Richardson, Bristol, Africa and the Eighteenth-Century Slave Trade to America 3 vols. I, 1698-1729(1986), II, 1730-45 (1987), III, 1746-69(1991), Bristol Record Society.

4 BRL, Bristol Presentments, volumes covering years 1773-94.

5 Univ. of Melbourne Archives, Bright Papers, Vol. VI. For example on the voyage of the Bristol Merchant 1747-8 (owned by Henry Tongue, major shareholder in the Bristol Brass Co.), these goods made up more than one quarter of the cargo with which the ship's master was to purchase Negroes at Bonny in the Bite of Africa for sale in Jamaica.

6 Eric Williams, Capitalism and Slavery (1944). A distinction is made between the investment of slave profits in heavy industries, insurance, and banking (with a reference to the Heywood Bank of Liverpool); those arising from the demands of the slave trade itself; and those concerned with the processing of raw materials from across the Atlantic. Only for the third category has no evidence been found within the region, though the tobacco and sugar industries for example were important in Bristol. The difference may be explained by the lesser need for water power.

7 Pierre M. Boule, 'Slave Trade, Commercial Organization and Industrial Growth in Eighteenth Century Nantes', Revue Francaise d'Histoire d'Outre-Mer, LIX(1972), pp.70-112.

8 BAO, 28048, F2/1, F5, F6/1.

9 R.G. Wilson, 'The Supremacy of the Yorkshire Cloth Industry in the Eighteenth Century', in N.B. Harte & K.G. Ponting eds. Textile History and Economic History (Manchester, 1973), pp.225-46 and Pat Hudson, 'Proto-industrialization: the case of the West Riding Wool Textile Industry in the 18th and early 19th centuries', History Workshop, Issue 12(1981), pp.34-61, both contain interesting comparisons with the west of England cloth industry.

10 Philip Richardson, 'The Structure of Capital during the Industrial Revolution Revisited: two case studies from the cotton textile industry', Econ.Hist.Rev., 2nd ser. XLII, 4 (1989), pp.484-503; Brian Short, 'The De-Industrialisation Process: a case study of the Weald, 1600-1850' in Hudson ed., Regions and Industries (1989), pp.156-74; P.J. Cain & A.G. Hopkins, 'Gentlemanly Capitalism and British Expansion Overseas. I. The Old Colonial System, 1688-1850'.

Sources and Bibliography

The following abbreviations have been used:

Agric.Hist.Rev.	Agricultural History Review
BIAS Jnl.	Journal of the Bristol Industrial Archaeological Society
Bus.Hist.	Business History
Br.Hist.Assoc.	Bristol Historical Association
Br.Rec.Soc.	Bristol Record Society
C.E.H.E.	Cambridge Economic History of Europe, vol.VII
Econ.Hist.Rev.	Economic History Review
Ind.Arch.Rev.	Industrial Archaeology Review
Jnl.Europ.Econ.Hist.	Journal of European Economic History
Jnl.Econ.Hist.	Journal of Economic History
Jnl.Hist.Geog.	Journal of Historical Geography
Jnl.Interdisc.Hist.	Journal of Interdisciplinary History
Jnl.Trans.Hist.	Journal of Transport History
Jnl.Roy.Stat.Soc.	Journal of the Royal Statistical Society
Letters & Papers	Letters and Papers selected from the Correspondence Book of the Bath and West of England Society
Phil.Trans.Roy.Soc.	Philosophical Transactions of the Royal Society
Proc.Som.Arch.Nat.Hist.Soc.	Proceedings of the Somerset Archaeological and Natural History Society
Trans.Am.Phil.Soc.	Transactions of the American Philosophical Society
Trans.B. & G.Arch.Soc.	Transactions of the Bristol and Gloucestershire Archaeological Society
Trans.Inst.Brit.Geogs.	Transactions of the Institute of British Geographers
Trans.Newc.Soc.	Transactions of the Newcomen Society
Trans.Roy.Hist.Soc.	Transactions of the Royal Historical Society
Southern Hist.	Southern History
V.C.H.Somerset	Victoria County History of Somerset

1 Manuscripts

Somerset Record Office (SRO)

Commissions of the Peace Q/JC, 110-124, for years 1739-1830.
Q/JC, 1-2, printed copies 1820-1837.
Q/JQ, 1-9, property qualifications and oaths of office, 9 rolls

for years from 1749.
Q/JCp, 1-12, papers and correspondence.

Enclosure Awards Q/RDe.

Additional information on enclosures DD/S/CX; DD/FS; DD/BK.

Somerset River Board Papers (incl.Commissions of Sewers) D/RA.
Axe Drainage AD 1-6.
Congresbury and Weston Drainage SW 1-18.

Turnpike Trust Records D/T, particularly those of the Bath
Turnpike Trust D/T/ba 1-47.
Quarter Sessions Records Q/R. Annual statements of account
1820 and 1822-33. Also series of deposited plans.

Somerset Coal Canal DD/DP, DD/MY, DD/NC, DD/X/ON.
Share Certificates, correspondence, plans.

Estate and Family Papers.

Beachamp and Jarret DD/NCB and DD/BE.
Dickinson (incl.the related Prankard,Goldney and Fuller
families) DD/DN.
Gore and Gibbs DD/GB.
Gore Langton DD/GL.
Hippisley DD/HI.
Hylton DD/HY
Mogg DD/MGG.
Popham DD/PO.
Rees Mogg DD/RM.
Samborne DD/SA.
Strachey DD/SH.
Waldegrave DD/WG.

Solicitors' Deposits.

Baker DD/BK.
Foster DD/FS.
Osborne, Ward, Vassall, and Abbot DD/OB.
Pennington and Son DD/PN.
Sparks and Blake DD/SB.

Weston-super-Mare Public Reference Library (WSM)

Baker Papers S/W56/34, S/W17/43.

Bristol Archive Office (BAO)

Minute Books of the Common Council.

Documents relating to enclosure and drainage.

Sturge Papers 32395; 25642.
Congresbury 09337; 33041.
Portbury 01097(5).
Portishead 04203; 04204; 16667.
Weston 00545; 01101; 04203; 04205.

Mining leases, Clapton, 12157.

Estate and Family Papers.

Smythe 4168; AC/AS 97/6-12; AC/AS 93.

Harford 28048.

Lovell (Bishop Sutton Pit) 21779.

Vaughan 12171.

Bristol Public Reference Library (BRL)

'The Committee Book ..of the Joseph Percival & Copper Company',
B4771.

Bath Guildhall Archives (BGA)

Documents of Bath Corporation.

Minute Books of the Common Council, volumes 6-14, 1738-1834.

Chamberlain's Accounts 1733-1846.

Accounts of loans to the Corporation 1765-1803.

Leases of Corporation property, summaries of which are included in minute books.

Bath Improvement Commissioners.

Order Book 1789-1832.

Oath Book 1789-1815.

Cash Books 1789-1810, 3 vols.

Bond Book 1789-1823.

Philip George Papers, sr. and jr.

Documents of the Bath and West of England Society. (The Library of the Society is housed at the University of Bath).

Public Record Office (PRO)

Records of the Law Courts.

Court of Bankruptcy, B1-12. Order Books (B1) contain petitions arising from bankruptcy cases.

Court of Chancery, C12-13; and Chancery Masters' Exhibits, C104-113, C117.

Courts of Exchequer, E112, E134. Depositions by commissions, traditionally covering cases in which Crown had an interest

Chatham Papers.

Estimate of bankruptcies March 1793, 30/8/183 Part 1.

List of country bankers for 1799, 30/8/274.

Papers of the River Avon Navigation (at Kew), RAIL 805.

British Library

Material relating to attorneys.

'Lists of Attornies and Solicitors Admitted in Pursuance of the late Act (2 Geo.II,c.23)', in Sheila Lambert ed. House

of Commons Sessional Papers of the Eighteenth Century(1975)
vol.13.

Law Lists: Brownes's General Law List,1777-97; Hughes' New Law List,1798-1806; Clarke's New Law List,1806-30.

2 Parliamentary Papers

Journals of the House of Commons.

Journals of the House of Lords.

Statutes of the Realm.

House of Lords Record Office

Sessional Papers of the House of Commons.

1821 (747) iv, 343, 'Report from the Select Committee appointed to consider the Acts now in force regarding Turnpike Roads and Highways in England and Wales'.

1847-8 (752) lx, 413-36, 'Return of the Length of Road in each Turnpike Trust in England and Wales'.

Sessional Papers of the House of Lords.

1833 (81 & 24) cccxxiii p.1 et seq., 'Reports of the Select Committee to examine the Turnpike Returns now upon the Table, and the Abstract thereof'.

1840 xliii, 'The Report of the Commissioners for inquiring into the State of Roads in England and Wales'.

3 Directories

Crutwell, Richard. The Stranger's Assistant and Guide to Bath (Bath,1773).

Sketchley's Bristol Directory of 1775 (Bath,reprint 1971).

Bailey's British Directory for 1784 4 vols. of which vol.2 is the western directory.

Bailey's British Directory for 1787.

The Universal British Directory of Trade, Commerce, and Manufacture 5 vols. 1790-98.

Read, John. New Bristol Directory for the Year 1792.

Matthew's New Bristol Directory for 1793-4 (Bristol, 1793).

Corrected edns.in 1795,1797,1799-1800,1801,1803,1805, and annually thereafter.

Robbins, G. Robbins' Bath Directory (Bath, 1800).

Browne, J. The Bath Directory for the year 1805.

Holden, Messrs. Holden's Triennial Directory for 1805, 1806, and 1807.

- Browne, J. The New Bath Directory for the Year 1809.
Wood and Cunningham, The New Bath Directory, corrected to 1812.
Gye, H. Gye's Bath Directory, corrected to January 1819.
Keene, John and James. Keenes's Improved Bath Directory
corrected to January 1824.
Keene, John and James. The Bath Directory corrected to January
1826.
Keene, John and James. Keene's Bath Directory corrected to
January 1829.
Silverthorne, H. Bath Directory corrected to April 1833.
Robson's General Directory for the County of Somerset (Taunton,
1840), 8 vols.

4 Maps

- 'An Actual Survey of the City of Bath, in the county of
Somerset, and of Five Miles Round Survey'd by Tho.Thorpe
in the Year 1742'.
Bowen, Emanuel. 'An Improved Map of the County of Somerset
Divided into its Hundreds...with Historical Extracts
relative to its Natural Produce, Trade, Manufactures &c.',
(1750).
Day & Masters. 'County of Somerset survey'd by Day and
Masters, 1782'. First large-scale map of the county.
Haywood, J. 'A Map of Somersetshire engraved from an actual
survey', (1790).
Ordnance Survey of England and Wales 1809-17. For the county of
Somerset see Sheets 18-21 (Newton Abbot, repr. 1969).
Greenwood, C. & J. 'Map of the County of Somerset, from an
Actual Survey made in the years 1820 and 1821', (1822).

5 Unpublished Theses

- Brown, Bryan. 'A Survey of the Development of the Leisure
Industries of the Bristol Region', Ph.D. thesis, University
of Bath, 1971.
Chapman, John. 'Changing Agriculture and the Moorland Edge in
the North York Moors', M.A. thesis, University of London, 1961.
Cox, Christopher. 'The Development and Decline of the Turnpike
System in the Stroudwater Area of Gloucestershire 1725-
1875', Ph.D. thesis, University of London, 1987.
Croot, Patricia E.C. 'Aspects of Agrarian Society in Brent
Marsh, Somerset, 1500-1700', Ph.D. thesis, University of Leeds,
1982.
Davis, G.P. 'Social and Economic Change in a Somerset Village,
Newton St. Loe, 1801-1871', M.Sc. thesis, University of Bath,
1975.
Davis, J.F. 'The Forest of Dean and Bristol and Somerset Coal-
fields', Ph.D. thesis, University of London, 1959.
Ellis, J.R. 'Parliamentary Enclosure in Wiltshire', Ph.D.
thesis, University of Bristol, 1971.
Ferriman, B.D. 'An Historical Geography of Coal Mining in the
Radstock Basis', M.Sc. thesis, University of Bristol, 1977.
Ginarlis, J.E. 'Road and Waterway Investment in Britain 1750-

- 1830', Ph.D. thesis, 1970.
- Hall, I.V. 'A History of the Sugar Trade in England with special attention to the Sugar Trade of Bristol', M.A. thesis, 2 vols., University of Bristol, 1925.
- Hunt, H.G. 'The Parliamentary Enclosure Movement in Leicestershire 1750-1850', Ph.D. thesis, University of London, 1956.
- Jackson, Stephen. 'Population and Change: A Study of the Spatial Variations in Population Growth in North East Somerset and West Wiltshire, 1701-1800', Ph.D. thesis, University of Liverpool, 1979.
- Jones, Donald. 'The Elbridge, Woolnough and Smyth Families of Bristol in the Eighteenth Century, with special reference to the Spring Plantation, Jamaica', Ph.D. thesis, University of Bristol, 1971.
- Lawrence, J.F. 'Somerset 1800-1830. An Inquiry into Social and Economic Conditions', M.Litt. thesis, University of Durham, 1938.
- Lieberman, D. 'The Province of Legislation Determined: Legal Theory in Eighteenth Century Britain', Ph.D. thesis, University of London, 1980.
- McIntyre, Sylvia. 'Towns as Health and Pleasure Resorts: Bath, Scarborough and Weymouth, 1700-1815', D.Phil. thesis, University of Oxford, 1973.
- Morgan, K.J. 'Bristol Merchants and the Colonial Trades, 1748-1783', D.Phil. thesis, University of Oxford, 1983.
- Neale, R.S. 'Economic Conditions and Working Class Movements in Bath, 1800-1850', M.A. thesis, University of Bristol, 1962.
- Oram, H.C. 'The Industrial Revolution and the Textile Industries of Somerset 1750-1870', M.A. thesis, University of Bristol, 1930.
- Palmer, Alice. 'The Low Wood Gunpowder Company 1798-1808: the History of an Industry in the Furness Area of Lancashire', Chorley College of Education, 1970.
- Pickering, Joanne. 'The Bristol-American Export Trade, 1773-75', M.A. thesis, University of Exeter, 1983.
- Pole, Stephen. 'Crime, Society, and Law Enforcement in Hanoverian Somerset', Ph.D. thesis, University of Cambridge, 1983.
- Rees, D.Gareth. 'The Role of Bristol in the Atlantic Slave Trade 1710-69', M.A. thesis, University of Exeter, 1970.
- Richardson, P.David. 'The Bristol Slave Trade in the Eighteenth Century', M.A. thesis, University of Manchester, 1969.
- Stembridge, Peggy K. 'Thomas Goldney (1696-1768), Aspects of the Life of a Bristol Merchant', M.Litt. thesis, University of Bristol, 1982.
- Turner, M.E. 'Some Social and Economic Considerations of Parliamentary Enclosure in Buckinghamshire 1738-1865', Ph.D. thesis, University of Sheffield, 1973.
- Ward, J.R. 'Investment in Canals and House-building in England, 1760-1815', D.Phil. thesis, University of Oxford, 1970.
- West, Jenny. 'The Supply of Gunpowder to the Ordnance Office in the Mid-Eighteenth Century, with special reference to Supply, Distribution, and Legislation during the Seven Years War', Ph.D. thesis, University of London, 1986.

6 Published Books and Articles

- Acaster, E.J.T. 'Benjamin Heywood, Sons and Company: Bankers in Manchester 1788-95', Three Banks Rev., 119(1978), pp.47-57.
- Acland, T.D. 'On the Farming of Somersetshire', Jnl.Roy.Agric.Soc., XI(1850). Reprinted with contribution by Wm.Sturge in The Farming of Somersetshire(1851).
- Addis, John P. The Crawshay Dynasty, a Study in Industrial Organization and Development, 1765-1867(Cardiff,1957).
- Albert, William. The Turnpike Road System in England 1663-1840 (1972).
'Popular Opposition to Turnpike Trusts in Early Eighteenth Century England', Jnl.Trans.Hist., new ser.V,1(1979) pp.1-15.
- Aldcroft, D.H. & Freeman, M.J. Transport in the Industrial Revolution(Manchester,1981).
- Alford, B.W.E. W.D. & H.O.Wills and the Development of the U.K. Tobacco Industry 1786-1965(1973).
'The Flint and Bottle Glass Industry in the Early Nineteenth Century: A Case Study of a Bristol Firm', Bus.Hist. X,1(1968), pp.12-21.
'Entrepreneurship, Business Performance and Industrial Development', Bus.Hist., XIX,2(1977), pp.116-33.
- American National Bureau of Economic Research, Problems of Capital Formation : Concepts, Measurement, and Controlling Factors(Princeton,1957).
Capital Formation and Economic Growth(Princeton,1955).
- Anderson, B.L. 'Provincial Aspects of the Financial Revolution of the Eighteenth Century', Bus.Hist., XI,1(1969), pp.11-22.
'Money and the Structure in the Eighteenth Century' Bus.Hist., XII,2(1970), pp.85-101.
'The Attorney and the Early Capital Market in Lancashire' in Crouzet ed. Capital Formation in the Industrial Rev. (1972), pp.223-55.
'Law, finance and economic growth in England: some long-term influences' in Barrie M. Ratcliffe ed. Great Britain and her World, 1750-1914(1975).
'The Lancashire bill system and its Liverpool practitioners: the case of a slave merchant' in Chaloner & Ratcliffe eds. Trade and transport(Manchester,1977), pp.59-97.
'Financial Institutions and the capital market on Merseyside in the eighteenth and nineteenth centuries' in Anderson & Stoney eds. Commerce, Industry and Transport, Economic Change on Merseyside(Liverpool,1983).
- Anstey, Roger. The Atlantic Slave Trade and British Abolition, 1760-1810(1975).
- Anstey, Roger & Hair, P.E.eds. Liverpool, the Slave Trade and Abolition(Liverpool,1976).
- Anstie, John. The Coalfields of Gloucestershire and Somersetshire(1873, repr.Bath,1969).
- Ashton, T.S. An Economic History of England: The Eighteenth Century(1955).
Economic Fluctuations in England, 1700-1800(Oxford,1959).

- ed., Letters of a West African Trader, Edward Grace, 1767-1780 (1950).
- Atthill, Robin. Old Mendip (Newton Abbot, 1964).
ed., Mendip, A New Study (Newton Abbot, 1976).
- Attwood, Brian. 'The BIAS Paper Mills Survey', BIAS Jnl., 3 (1970), pp. 11-21.
- Aylett, Philip. 'Attorneys and Clients in Eighteenth-Century Cheshire: A Study in Relationships, 1740-1785', Bull. John Rylands Library, 67 (1987), pp. 326-58.
- Aylmer, G.E. 'The Meaning and Definition of "Property" in Seventeenth-Century England', Past and Present, LXXXVI (1980), pp. 87-97.
- Baber, Colin & Williams, L.J. eds., Modern South Wales: Essays in Economic History (Cardiff, 1986).
- Barker, T.C. & Harris, J.R. A Merseyside Town in the Industrial Revolution: St. Helens, 1750-1900 (1959).
- Barley, M.W. A Guide to British Topographical Collections (1974).
- Barnes, Thomas Garden, Somerset 1625-1640, A County's Government During the 'Personal Rule' (Oxford, 1961).
The Clerk of the Peace in Caroline Somerset (Leicester, 1961).
- Bateman, J. General Turnpike Acts (1828).
- Baugh, Daniel A. ed. Aristocratic Government and Society in Eighteenth-Century England (New York, 1975).
- Baxter, W.T. & Davidson, S. Studies in Accounting Theory (1962).
- Bayley, Nathaniel. English Dictionary (1721, 23rd edn. 1773).
- Beaumont, John. 'On a New Way of Cleaving Rocks', Phil. Trans. Roy. Soc., XV, 167 (1684/5), p. 854.
- Beckett, J.V. 'The Eighteenth-Century Origins of the Factory System: A Case Study from the 1740s', Bus. Hist., XIX, 1 (1977), pp. 55-67.
'English Landownership in the Later Seventeenth and Eighteenth Centuries', Econ. Hist. Rev., 2nd ser. XXX, 4 (1977), pp. 567-81.
Coal and Tobacco: The Lowthers and the Economic Development of West Cumberland 1660-1760 (Cambridge, 1981).
'The Pattern of Landownership in England and Wales, 1660-1880', Econ. Hist. Rev., 2nd ser. XXXVII, 1 (1984), pp. 1-22.
- Beckett, J.V. & Heath, J.E., 'When was the Industrial Revolution in the East Midlands?', Midland Hist., XIII (1988), pp. 77-94.
- Bee, Malcolm. 'Business History as Local History', Bus. Hist. Newsletter, 14 (1987), pp. 5-7.
- Belcher, Victor. 'A London Attorney of the Eighteenth Century: Robert Andrews', London Jnl., 12, 1 (1986), pp. 40-50.
- Berend, Ivan T. & Ranki, Gyorgy., The European Periphery and Industrialization 1780-1914 (Cambridge, 1982).
- Beresford, M.W. 'The Commissioners of Enclosure', Econ. Hist. Rev., 2nd ser. XVI, 2 (1946), pp. 130-40.
- Berrill, K. 'International Trade and the Rate of Economic Growth', Econ. Hist. Rev., 2nd ser. XII, 3 (1960), pp. 351-59.
- Betty, J.H. The Rise of a Gentry Family c.1500-1642, The Smyths of Ashton Court (Hist. Assoc. Bris. Branch, 1978).
'Graffin Prankard, an Eighteenth-century Bristol Merchant' Southern History, 12 (1990), pp. 34-47.

- Billingsley, John. 'Account of the Culture of Carrots and Thoughts on Burn-baiting on Mendip Hills', Letters and Papers, I(1788), pp.214-9.
'On the Culture of Potatoes', Annals of Agriculture, XXI(1793), pp.1-32.
General View of the Agriculture of the County of Somerset, drawn up in 1795(Bath, 1797 edn.).
'On the Uselessness of Commons to the Poor', Annals of Agriculture, XXXI(1798), pp.27-32.
'Remarks on the Utility of the Bath and West of England Society', Letters and Papers, X(1805), pp.1-93.
'Essay on the Best Method of Inclosing...Waste Lands', Letters and Papers, XI(1807).
- Birch, Alan, 'Carron Company 1784-1822: The Profits of Industry During the Industrial Revolution', Expl.Entrep.Hist., 8,2(1955), pp.66-79.
Economic History of the British Iron and Steel Industry, 1784-1879(1967).
- Birks, Michael. Gentlemen of the Law(1960).
- Blanchard, Ian. 'Labour Productivity and Work Psychology in the English Mining Industry, 1400-1600', Econ.Hist.Rev. 2nd ser.XXXI,1 (1978), pp.1-24.
- Blaug, M. 'The Productivity of Capital in the Lancashire Cotton Industry during the Nineteenth Century', Econ.Hist.Rev., 2nd ser.XIII(1961).
- Boddely, Thomas. The Bath and Bristol Guide 1755(3rd edn. repr.Bath, 1969).
- Bond, Maurice F. Guide to the Records of Parliament(1971).
- Booker, John. Essex and the Industrial Revolution(Chelmsford, 1974).
- Boule, Pierre M. 'Slave Trade, Commercial Organization and Industrial Growth in Eighteenth Century Nantes', Revue Francaise d'Histoire d'Outre-Mer, LIX(1972), pp.70-112.
- Bowman, Andrew. 'A Short History of the Nailsea Coalfields 1500-1890' Jnl.Som.Mines Res.Group, I,3(1982), pp.46-63.
- Boyce, Benjamin. The Benevolent Man, A Life of Ralph Allen of Bath((Harvard UP, 1967).
- Brace, Keith. Portrait of Bristol(1971).
- Brewer, John & Styles, John. An Ungovernable People. The English and their Law in the Seventeenth and Eighteenth Centuries(1980).
- Bristol Law Society. The First Two Hundred Years(Bristol, 1970).
- Brown, Richard. A History of Accounting and Accountants(Edinburgh, 1905).
- Bruland, Kristine. British Technology and European Industrialization: The Norwegian Textile Industry in the Mid-Nineteenth Century(Cambridge, 1989).
- Buchanan, B.J. 'Comment on the Manufacture of Black Powder', Jnl.Soc.Ind.Arch., 2, (Univ.West Virginia, 1976), pp.75-80.
'The Financing of Parliamentary Waste Land Enclosure: Some Evidence from North Somerset, 1770-1830', Agric.Hist.Rev., 30,2(1982), pp.112-26.
'The use of documentary sources in the interpretation of physical evidence: the Woolley powder works near Bristol',

- 4th.Conf.Internat.Lyon-Grenoble,1981, L'etude et la mise en valeur du patrimoine industriel(1985).
- 'The Evolution of the English Turnpike Trusts: Lessons from a Case Study',Econ.Hist.Rev.,2nd ser.XXXIX,2(1986), pp.223-43.
- 'Aspects of Capital Formation: Some Insights from North Somerset,1750-1830',Southern Hist.,8(1986),pp.73-93.
- 'The turnpike roads: a classic trap?',Jnl.Trans.Hist. 3rd ser.11,2(1990),pp.66-72.
- Buchanan, B.J. & M.T.Tucker, 'The Manufacture of Gunpowder: A Study of the Documentary and Physical Evidence Relating to the Woolley Powder Works near Bath',Ind.Arch.Rev.,5 (1981),pp.185-202.
- Buchanan, R.A. & Cossons, Neil. The Industrial Archaeology of the Bristol Region(Newton Abbot,1969).
- Bulley, John A. 'To Mendip for Coal : A Study of the Somerset-shire Coalfield before 1830',Proc.Som.Arch.Nat.Hist.Soc., 2 parts, vol.97(1953),pp.46-78 and vol.98(1955), pp17-54.
- Burke, Sir Bernard, Dictionary of the Peerage and Baronetage (35th edn.,1873).
- Burt, Roger. 'Lead Production in England and Wales,1700-1770', Econ.Hist.Rev.,2nd ser.XXII,2(1969), pp.249-68.
The British Lead Mining Industry(Redruth,1984).
- Butcher, E.E. Bristol Corporation of the Poor,1696-1898(1972).
- Butt, John. 'Capital Formation and Enterprise in the Scottish Iron Inustry 1780-1840', in John Butt & J.T.Ward eds., Scottish Themes(Edinburgh,1976).
'The Scottish Cotton Industry during the Industrial Revolution',in L.M.Cullen & T.C.Smout,Comparative Aspects of Scottish and Irish History(Edinburgh,1977).
- Cain, P.J. 'Bibliography of transport history in other periodicals,1985-6',Jnl.Trans.Hist.,3rd ser.8,2(1987),pp.202-9.
- Cain, P.J. & Hopkins, A.G. 'Gentlemanly Capitalism and British Expansion Overseas. I, The Old Colonial System,1688-1850',Econ.Hist.Rev.,2nd ser.XXXIX,4(1986),pp.501-25.
- Camden, William. Britannia(3rd edn.1753,two vols.,ed.E.Gibson).
- Cameron, Rondo E. & others. Banking in the Early Stages of Industrialization: a Study of Comparative Economic History(Oxford,1964).
- Campbell, R.H. The Carron Company((Edinburgh & London,1961).
- Carus-Wilson, E.M. Medieval Merchant Venturers(1967).
- Cave, G.H. History of Banking in Bristol(Bristol,1899).
- Central Statistical Office, National Accounts Statistics, Sources and Methods(1968).
- Chalklin, C.W. The Provincial Towns of Georgian England, A Study of the Building Process 1740-1820(1974).
'Capital Expenditure on Building for Cultural Purposes in Provincial England,1730-1830',Bus.Hist.XXII,1(1980), pp.51-70.
'The Financing of Church Building in the Provincial Towns of Eighteenth-Century England',in Peter Clark ed.,English Provincial Towns(1984).
- Chalklin, C.W. & Havinden, M.A.eds. Rural Change and Urban

- Growth 1500-1800(1974).
- Chalklin, C.W. & Wordie, J.R.eds. Town and Countryside. The English Landowner in the National Economy,1660-1860(1989).
- Chambers, J.D. 'The Vale of Trent,1670-1800: a Regional Study of Economic Change',Econ.Hist.Rev.,Supplement 3(1957).
- Chambers, J.D. & Mingay, G.E. The Agricultural Revolution 1750-1850(1966).
- Chaplin, W.R. 'The History of Flatholm Lighthouse',The American Neptune,XX(1960),pp.5-43.
- Chapman, John. 'Parliamentary Enclosure in the Uplands: The Case of the North York Moors',Agric.Hist.Rev.,XXIV,1 (1976),pp.1-17.
'Land Purchasers at Enclosure: Evidence from West Sussex',Local Historian,12,7(1977),pp.337-40.
'The Parliamentary Enclosures of West Sussex',Southern History,II(1980),pp.73-91.
- Chapman, S.D. The Early Factory Masters.The Transition to the Factory System in the Midlands Textile Industry(Newton Abbot,1967).
'Fixed Capital Formation in the British Cotton Industry 1770-1815',Econ.Hist.Rev.2nd ser.XXIII,2(1970),pp.235-66.
'Financial Restraints on the Growth of Firms in the Cotton Industry,1790-1850',Econ.Hist.Rev.,2nd ser.XXXII,1(1979),pp.50-69.
- Charlesworth, Andrew. An Atlas of Rural Protest in Britain 1548-1900(1983).
- Chartres, J.A. 'Road Carrying in England in the Seventeenth Century: Myth and reality',Econ.Hist.Rev.,2nd ser.XXX,1 (1977),pp.73-94.
Internal Trade in England 1500-1700(1977).
'Review of Periodical Literature,1978',Econ.Hist.Rev.,2nd ser.XXXIII,1(1980),pp.134-7.
- Checkland, S.G. 'Finance for the West Indies,1780-1815',Econ.Hist.Rev.,2nd ser.X(1957-8),pp.461-9.
- Cheney, C.R. Handbook of Dates for Students of English History(1961).
- Chubb, T. A Descriptive List of the Printed Maps of Somersetshire(Taunton,1914).
- Clark,Colin. 'Capital in Agriculture',Farm Economist,IX(1959), pp.28-34.
The Value of Agricultural Land(Oxford,1973).
- Clark, Peter ed. The Transformation of English Provincial Towns 1600-1800(1984).
'Migrants in the city:the process of social adaptation in English towns,1500-1800', in Peter Clark & David Souden eds. Migration and Society in Early Modern England(1987).
- Clay, Christopher. 'The Price of Freehold Land in the Later Seventeenth and Eighteenth Centuries',Econ.Hist.Rev.,2nd ser.XXVII,2(1974),pp.173-89.
'Lifeleasehold in the Western Counties of England 1650-1750',Agric.Hist.Rev.,29,2(1981),pp.83-96.
'Property Settlements..and Sale of Land by the Greater Landowners 1660-1790',Jnl.Brit.Studies,XXI(1981),pp.18-38
- Clemens, Paul G.E. 'The Rise of Liverpool,1665-1750',Econ.

- Hist.Rev., 2nd ser.XXIX, 2(1976), pp.211-25.
- Clew, Kenneth R. The Kennet and Avon Canal(Newton Abbot, 1968).
The Somersetshire Coal Canal and Railways(Newton Abbot, 1970).
The Dorset and Somerset Canal(Newton Abbot, 1971).
- Coleman, D.C. The British Paper Industry, A Study in Industrial Growth(Oxford, 1958).
'Growth and Decay during the Industrial Revolution: the Case of East Anglia', Scand.Econ.Hist.Rev., X, 2(1962).
Courtaulds, an Economic and Social History(Oxford, 1969).
- Collinson, John. The History and Antiquities of the County of Somerset: Collected from Authentick Records and an Actual Survey by the late Mr.Edmund Rack(Bath, 1791). 3 vols.with index and supplement(Taunton, 1898).
- Collis, Ivor P. 'Lease for a Term of Years Determinable with Lives', Jnl.Soc.Archivists, I, 6 (1957), pp.165-171.
- Colquhoun, P. A Treatise on the Wealth, Power and Resources of the British Empire(1814).
- Cooke, C.A. Corporation, Trust and Company(Manchester, 1950).
- Cooper, J.P. 'The Social Distribution of Land and Men in England', Econ.Hist.Rev., 2nd ser.XX, 3(1967), pp.419-40.
- Corfield, Penelope J. 'Georgian Bath, The Magical Meeting Place', History Today, 40(1990), pp.27-33.
- Corry, B.A. Money, Saving and Investment in English Economics 1800-1850(1962).
- Court, W.H.B. The Rise of the Midland Industries(Oxford, 1938).
- Coysh, A.W., Mason, E.J., & Waite, V. The Mendips(1954).
- Crafts, N.F.R. 'English Economic Growth in the Eighteenth Century: A Re-examination of Deane and Cole's Estimates' Econ.Hist.Rev., 2nd ser.XXIX, 2(1976), pp.226-35.
'Determinants of the Rate of Parliamentary Enclosure', Expl.Econ.Hist., 14, 3(1977), pp.227-49.
- Crocker, Glenys. The Gunpowder Industry(1986).
Gunpowder Mills Gazetteer(1988), compiled for Gunpowder Mills Study Group.
- Crouzet, Francois ed. Capital Formation in the Industrial Revolution(1972).
- Cunningham, W. 'Unconscious Assumptions in Economics', Jnl.Roy.Stat.Soc., LXVIII(1905), pp.715-24.
- Curtler, W.H.R. The Enclosure and Redistribution of our Land (Oxford, 1920).
- Darby, H.C.ed. An Historical Geography of England Before AD 1800(Cambridge, 1936).
The Draining of the Fens(Cambridge, 1940).
- David, Paul A. 'The Growth of Real Product in the U.S.before 1840: New Evidence and Controlled Conjecture', Jnl.Econ.Hist., 27(1967), pp.151-95.
- Davies, K. 'The Eighteenth Century Copper and Brass Industries of the Greenfield Valley', Trans.Hist.Soc.of Cymmrodorion, (1979), pp.203-32.
- Davies, K.G. 'Joint -Stock Investment in the Later Seventeenth Century' in E.M.Carus-Wilson ed. Essays in Economic History(1962, Vol.II).
- Davis, G.P. 'Coal mining at Newton St.Loe', Bias Jnl., 10(1977),

- pp.27-33.
- Davis, Lance E., Review in Jnl.Interdisc.Hist.,17(1986), pp.467-70.
- Davis, Lance E., Easterlin, Richard A., Parker, William N.eds. American Economic Growth: An Economist's History of the United States(New York,1972).
- Davis, Lance E., Hughes, J.R.T., McDougall, Duncan eds., American Economic History : The Development of a National Economy(Illinois,1969).
- Davis, Ralph. 'English Foreign Trade,1660-1700',Econ.Hist.Rev. 2nd ser.VI(1954),pp.150-66.
'English Foreign Trade,1700-1774',Econ.Hist.Rev.,2nd ser. XV(1962),pp.285-303.
The Rise of the Atlantic Economies(1973).
- Davis, Thomas. 'On the Management of Marshfields',Letters & Papers,X(1805),pp.324-7.
- Day, Joan. Bristol Brass, A History of the Industry(Newton Abbot,1973).
'The Costers: Copper Smelters and Manufacturers',Trans. Newc.Soc.,47(1974-6),pp.47-58.
- Deane, Phyllis. 'Capital Formation in Britain before the Railway Age' in Crouzet ed. Capital Formation in the Industrial Revolution(1972).
'The Role of Capital in the Industrial Revolution',Expl. Econ.Hist.,10,4(1973),pp.349-64.
- Deane, Phyllis & Cole, W.A. British Economic Growth 1688-1959: Trends and Structure(Cambridge,2nd edn.1967).
- Defoe, Daniel. A Tour Through England and Wales(1927 edn., intro. G.D.H. Cole,2 vols.).
- Devereux, Roy. John Loudon McAdam(Oxford,1936).
- Devine, T.M. The Tobacco Lords:A Study of the Tobacco Merchants of Glasgow and their Trading Activities c.1740-90 (Edinburgh,1975).
'The Colonial Trades and Industrial Investment in Scotland,c.1700-1815',Econ.Hist.Rev.,2nd ser.XXIX,1,(1976), pp.1-13.
'An Eighteenth Century Business Elite: Glasgow West Indian Merchants c.1750-1815',Scot.Hist.Rev.,LVII,1(1978).
- Dibben, A.A. Title Deeds, Thirteenth to Nineteenth Centuries (1971).
- Dickson, P.G.M. The Financial Revolution in England. A Study in the Development of Public Credit(1967).
- Donnachie, Ian. 'Sources of Capital and Capitalization in the Scottish Brewing Industry,c.1750-1830',Econ.Hist.Rev.,2nd ser.XXX,2(1977),pp.269-83.
A History of the Brewing Industry in Scotland(Edinburgh, 1979).
- Down, C.G. & Warrington, A.J. The History of the Somerset Coalfield(Newton Abbot,n.d.).
- Drake, B.K. 'Continuity and Flexibility in Liverpool's Trade with Africa and the Caribbean',Bus.Hist.,18,(1976),pp. 85-97.
- Dubois, Armand B. The English Business Company after the Bubble Act 1720-1800(New York,1938).

- Dunning, Robert W. A History of Somerset(Bridgwater,1978).
A History of Somerset(Chichester,1983).
- Earle, Bryan. Cornish Explosives(Penzance,1978).
- Eden, Peter ed. Dictionary of Land Surveyors and Local Cartographers of Great Britain and Ireland 1550-1850(Parts I 1975, II 1976, III 1976, Supplement 1979).
- Elton, Arthur. 'The Pre-history of Railways, with Special Reference to the Early Quarry Railways of North Somerset', Proc.Som.Arch.Nat.Hist.Soc.,107(1963),pp.31-59.
- Elton, Arthur & Elton, Margaret Ann. Clevedon Court(1979).
- Emery, F.V. 'Fresh Light on Dr.John Lane of the Copper Industry at Swansea', Gower,XX(1969),pp.8-13.
- Engerman, Stanley. 'The Slave Trade and British Capital Formation in the Eighteenth Century', Bus.Hist.Rev.,XLVI,4 (1972), pp.430-44.
- Everitt, Alan. 'The Market Town' and 'The Open Market' in Agri. Hist.Eng.,IV(1967).
 'Country,County,and Town : Patterns of Regional Evolution in England',Trans.Roy.Hist.Soc.,29(1979),pp.79-108.
- Farr, G.E. Somerset Harbours(1954).
- Farnie, D.A. 'The Commercial Empire of the Atlantic,1607-1783', Econ.Hist.Rev.,2nd ser.XV,2(1962),pp.205-18.
- Feinstein, Charles H. Domestic Capital Formation in the United Kingdom,1920-1938(Cambridge,1965).
National Income,Expenditure and Output of the United Kingdom,1855-1965(Cambridge,1972).
 'Capital Formation in Great Britain' in Cambridge Economic History of Europe(Vol.VII,part 1,1978).
- Feinstein, Charles H. & Sidney Pollard eds. Studies in Capital Formation in the United Kingdom 1750-1920(Oxford,1988).
- Findlay, D.C. The Soils of the Mendip District of Somerset (Harpenden,1965).
- Flinn, M.W. A History of the British Coal Industry(Oxford, 1984,Vol.II).
- Floud, Roderick & McCloskey, Donald eds. The Economic History of Britain since 1750(Cambridge,1981,2 vols).
- Freeman, Michael. 'The industrial revolution and the regional geography of England: a comment',Trans.Inst.Brit.Geogs., 9,2(1984),pp.507-12.
- Gayer, A.D., Rostow, W.W., & Schwartz, A.J. The Growth and Fluctuations of the British Economy,1790-1850(Oxford, 1953, 2 vols).
- Gemery, H.A. & Hogendorn, J.S. The Uncommon Market: Essays in the Economic History of the Atlantic Slave Trade(New York,1979).
- General Report on Enclosures Drawn up by Order of the Board of Agriculture(1808).
- Genovese, Eugene D. & Fox-Genovese, Elizabeth. Fruits of Merchant Capital, Slavery and Bourgeois Property in the Rise and Expansion of Capitalism(Oxford,1983).
- Ginarlis, John & Pollard, Sidney. 'Roads and Waterways,1750-1850' in Feinstein & Pollard eds.,Studies in Capital Formation in the United Kingdom,pp.182-224.
- Ginswick, J. 'Early Australian Capital Formation 1836-1850. A

- Case Study: The Australian Gaslight Company', Bulletin of Bus.Arch.Council of Australia, I, part 6, pp.27-49 & part 7, pp.43-9 (both 1959-60).
- Glanvil, Rev. Joseph. 'On the Mendip Lead Mines', Phil.Trans. Roy.Soc., II, 28 (1667), p.525.
- Gonner, E.K.C. Common Land and Inclosure (1912).
'The Population of England in the Eighteenth Century', Jnl.Roy.Stat.Soc., LXXVI (1913), pp.261-96.
- Gough, J.W. The Mines of Mendip (Oxford, 1930, revised edn. Newton Abbot, 1976).
The Rise of the Entrepreneur (1969).
- Gould, Robert. 'Capital Formation in the Wirksworth Lead Mining Industry, 1700-1900', Bull.Peak District Mines Historical Society, Part 1, VI, 5 (1977), pp.233-40; Part 2, VII, 1 (1978), pp.21-7.
- Gower, L.C.B. The Principles of Modern Company Law (1969, 3rd edn).
- Grassby, R. 'English Merchant Capital in the late Seventeenth Century. The Composition of Business Fortunes', Past & Present, 46 (1970), pp.87-107.
'The Personal Wealth of the Business Community in Seventeenth Century England', Econ.Hist.Rev. 2nd ser. XXIII, 2 (1970), pp.220-34.
- Green, Emanuel. Bibliotheca Somersetensis: A catalogue of books, pamphlets...connected with Somerset (Taunton, 1902).
- Greenhill, B.J. 'Nailsea Glassworks', BIAS Jnl, IV (1971), pp.26-7.
- Greenwell, G.C. & McMurtrie, J.M. The Radstock Portion of the Somerset Coalfield (Bath, 1864).
- Gregory, Derek. 'The production of regions in England's industrial revolution', Jnl.Hist.Geog., 14, 1 (1988), pp.50-8.
- Griffin, A.R. Coalmining (1971).
'Industrial Archaeology as an Aid to the Study of Mining History', Industrial Archaeology, II.1 (1974), pp.11-28.
The British Coalmining Industry (1977).
- Habakkuk, H.J. 'The Long-term Rate of Interest and the Price of Land in the Seventeenth Century', Econ.Hist.Rev., 2nd ser. V (1952-3), pp.26-45.
'The English Land Market in the Eighteenth Century' in J.S.Bromley & E.H.Kossman eds. Britain and the Netherlands (1960).
'The Rise and Fall of English Landed Families, 1600-1800', Trans.Roy.Hist.Soc., 5th ser. XXIX (1979), pp.187-207.
- Haddon, John. Bath (1973).
- Hadfield, Charles. Canals of South West England (Newton Abbot, 1967).
- Hall, W.G. Man and the Mendips (Mendip Society, 1971).
- Hamilton, Henry. The English Brass and Copper Industries to 1800 (1926, repr. 1967).
- Harbin, S.W.Bates. Members of Parliament for the County of Somerset (Taunton, 1939).
- Harcourt, G.C. Some Cambridge Controversies in the Theory of Capital (Cambridge, 1972).
- Harris, J.R. The Copper King: A Biography of Thomas Williams of Llanidan (Liverpool, 1964).

- ed. Liverpool and Merseyside: Essays in the Economic and Social History of the Port and its Hinterland(1969).
- Harris, J.R., Cottrell, P.L. & Anderson, P.L.. The Supply of Capital and the Economic Development of Merseyside 1690-1880(Soc.Sc.Res.Counc.,HR 754,1977).
- Harte, N.B. & Ponting, K.G.eds. Textile History and Economic History(Manchester,1973).
- Harvey, Charles E. & Press Jon. Studies in the Business History of Bristol(Bristol,1988).
- Havinden, Michael. The Somerset Landscape(1981).
- Henderson, Edith. Foundations of English Administrative Law (Harvard U.P.,1955).
- Higgins, J.P.P. & Pollard Sydney eds. Aspects of Capital Investment in Great Britain 1750-1850: A Preliminary Survey(1971).
- Holderness, B.A. 'Landlord's Capital Formation in East Anglia, 1750-1870', Econ.Hist.Rev., 2nd ser.XXV,3(1972),pp.434-47.
- 'The English Land Market in the Eighteenth Century: the case of Lincolnshire', Econ.Hist.Rev., 2nd ser.XXVII,4 (1974),pp.557-76.
- 'Credit in English Rural Society before the Nineteenth Century, with special reference to 1650-1720', Agric.Hist. Rev.XXIV,2(1976),pp.97-109.
- 'Agriculture 1770-1860', in Feinstein & Pollard. Studies in Capital Formation(1988), pp.9-34.
- Homer, Henry. An Enquiry into the means of preserving and improving the Publick Roads of this Kingdom(1767).
- Homer, Sydney. A History of Interest Rates(Rutgers U.P.,1963).
- Honeyman, Katrina. Origins of Enterprise. Business Leadership in the Industrial Revolution(Manchester,1982).
- Hoppit, Julian. Risk and Failure in English Business, 1700-1800(Cambridge,1987).
- 'Counting the Industrial Revolution', Econ.Hist.Rev., 2nd ser.XLIII,2(1990),pp.173-93.
- Hudson, Kenneth. The Fashionable Stone(Bath,1971).
- The Bath and West: A Bicentenary History(Bradford-on-Avon,1976).
- 'The Membership of the Bath and West During its First 200 Years', Acta Musaeorum Agriculturae,XII(1978),pp.50-6.
- Hudson, Pat. 'Proto-industrialization: the case of the West Riding Wool Textile Industry in the 18th and early 19th centuries', History Workshop, Issue 12(1981),pp.34-61.
- The Genesis of Industrial Capital. A Study of the West Riding Wool Textile Industry c.1750-1850(Cambridge,1986).
- 'Review of Periodical Literature in Economic and Social History, 1986, 1700-1850', Econ.Hist.Rev., 2nd ser.XLI,1 (1988),pp.132-7.
- ed. Regions and Industries, a perspective on the industrial revolution in Britain(Cambridge,1989).
- 'Proto-industrialization', ReFresh, 10(1990).
- Humphrey, A.L. Somersetshire Parishes: A Handbook of Historical Reference to all Places in the County(1905).
- Husbands, Chris. 'Regional Change in a Pre-industrial Economy: wealth and population in England in the sixteenth and

- seventeenth centuries', Jnl.Hist.Geog., 13(1987), pp.345-59.
- Hyde, Francis E. Liverpool and the Mersey. The Development of a Port 1770-1970(Newton Abbot,1971).
- Hylton, Lord. A History of Kilmersdon(Taunton,1910).
- Inikori, J.E. 'Slavery and the Development of Industrial Capitalism in England', Jnl.Interdisc.Hist., XVII,4(1987), pp.771-93.
- Ison, Walter. The Georgian Buildings of Bristol(1952).
The Georgian Buildings of Bath from 1700 to 1830(1948, repr.Bath,1969).
- Jackson, Stephen. 'Population Change in the Somerset-Wiltshire Border Area, 1701-1800: A Regional Demographic Study', Southern Hist., 7(1985), pp.119-44.
- Jenkins, D.T. The West Riding Wool Textile Industry 1770-1835: A Study of Fixed Capital Formation, (Edington,1975).
'The Wool Textile Industry 1780-1850' in Feinstein & Pollard. Studies in Capital Formation(1988), pp.126-140.
- Jenkins, D.T. & Ponting, K.G. The British Wool Textile Industry Industry, 1770-1914(1982).
- John, A.H. The Economic Development of South Wales, 1750-1850 (Cardiff,1950).
'War and the English Economy, 1700-1763', Econ.Hist.Rev. 2nd ser.VII(1954-5)
- Jones, A.G.E. 'The Banks of Bath', Notes and Queries(1958), pp.277-83.
- Jones, E.L. 'Agricultural Origins of Industry', Past & Present, 40(1968), pp.58-71.
- Jordan, W.K. 'The Forming of the Charitable Institutions of the West of England', Trans.American Phil.Soc., new ser. 50,8(1960), pp.3-99.
- Kenwood, A.G. 'Fixed Capital Formation on Merseyside, 1800-1913', Econ.Hist.Rev., 2nd ser.XXXI,2(1978), pp.214-39.
'Transport Capital Formation and Economic Growth on Teeside, 1820-50', Jnl.Transport Hist., 3rd ser.II,2(1981), pp.53-71.
'Fixed Capital Formation in the Ports of the South Wales Coalfield, 1850-1913" in Baber & Williams eds. Modern South Wales(1986).
- Kindleberger, C.P. 'Commercial Expansion and the Industrial Revolution', Jnl.Europ.Econ.Hist., IV,3(1975), pp.613-54.
- Kirk, Harry. Portrait of a Profession...Solicitors, 1100 to the Present Day(1976).
- Kriedte, Peter, Medick, Hans, & Schlumbohm, Jurgen. Industrialization before Industrialization: Rural Industry in the Genesis of Capitalism(Cambridge,1981).
- Kuznets, Simon. Income and Wealth of the U.S. : Trends and Structure(Cambridge,USA,1952).
'International Differences in Capital Formation and Financing' in Nat.Bur.Econ.Res., Capital Formation and Economic Growth, pp.19-25.???.
Modern Economic Growth: Rate Structure and Spread(Yale U.P.,1966).
Quantitative Economic Research: Trends and Problems, (New York,1972).

- Lambert, Sheila ed. House of Commons Sessional Papers of the Eighteenth Century, vol.13, 'Lists of Attornies and Solicitors...', pp.1-290(1975).
- Landau, Norma. The Justices of the Peace, 1679-1760, (Univ. of Calif. P., 1984).
- Lane, F.C. 'Double Entry Bookkeeping and Resident Merchants', Jnl. Europ. Econ. Hist., VI, 1(1977), pp.177-91.
- Langton, John. 'The Industrial Revolution and the Regional Geography of England', Trans. Inst. Brit. Geogs., 9, 2(1984), pp.145-67.
- Latimer, John. The Annals of Bristol in the Seventeenth, Eighteenth and Nineteenth Centuries (Bristol, 1893, repr. Bath, 1970, 3 volumes).
- Lee, C.H. 'The Concept of Profit in British Accounting, 1760-1900', Bus. Hist. Rev., 49(1975), pp.6-36.
'Regional Growth and Structural Change in Victorian Britain', Econ. Hist. Rev., 2nd ser. XXXIV, 3(1981), pp.438-52.
Social Science and History. An Investigation into the Application of Theory and Quantification in British Economic and Social History (Soc. Sc. Res. Counc., 1983).
- Little, Anthony J. Deceleration in the Eighteenth-Century Economy (Croom Helm, 1976).
- Little, Bryan. The City and County of Bristol, a Study in Atlantic Civilisation (1954).
- Littleton, A.C. & Yamey, B.S. Studies in the History of Accounting (1956).
- Livock, D.M. 'The Accounts of the Corporation of Bristol, 1532-1835', Jnl. Accounting Res., III, 1(1965).
- Locke, Richard. 'On the Improvement of Meadow Land... of Somersetshire', Letters & Papers, V(1793), pp.179-224.
'An Historical Account of the Marsh-lands of the County of Somerset', Letters & Papers, VIII(1976), pp.259-84.
Supplement to Collinson's History of Somerset. Extracts from Locke's Survey of Somerset, with a short biography by F.M. Ward & foreword by R.B. Mowat (Taunton, 1939).
- Lloyd-Jones, R. & Le Roux, A.A. 'Marshall and the Birth and Death of Firms...', Bus. Hist., XXIV, 2(1982), 141-55.
- Low, J.M. 'The Rate of Interest: British Opinion in the Eighteenth Century', Manchester School, XXII(1954), pp.115-38.
- McGrath, Patrick. The Merchant Venturers of Bristol: A History Of the Society of Merchant Venturers of the City of Bristol (Bristol, 1975).
ed. Bristol in the Eighteenth Century (Newton Abbot, 1972).
- McGrath, Patrick & Cannon, John. Essays in Bristol and Gloucestershire History (Bristol, 1976).
- ManInnes, C.M. Bristol: a Gateway of Empire (1939, repr. Newton Abbot, 1970).
- MacInnes, C.M. & Whittard, W.F. Bristol and its Adjoining Counties (Bristol, 1955).
- McKendrick, Neil. 'Josiah Wedgwood and Cost Accounting in the Industrial Revolution', Econ. Hist. Rev., 2nd ser. XXIII, 1

- (1970), pp.45-67.
- McMurtrie, J.M. 'The Coal Fields of Somersetshire', Proc.Som. Arch. & Nat.Hist.Soc., XIII(1867).
- Malcolmson, Robert W. '"A set of ungovernable people": the Kingswood colliers in the eighteenth century' in Brewer & Styles, An Ungovernable People(1980), pp.85-127.
- Marcy, Peter T. 'Bristol's Roads and Communications on the Eve of the Industrial Revolution, 1740-1780', Trans.Bristol & Glos.Arch.Soc., LXXXVII(1969), pp.149-72.
- Mann, J.De L. The Cloth Industry in the West of England from 1640 to 1800(Oxford, 1971).
- Marriner, Sheila. 'Company Financial Statements as Source Material for Business Historians', Bus.Hist., 22, 2(1980), pp.203-35.
- Marshall, Gordon. Presbyteries and Profits: Calvinism and the Development of Capitalism in Scotland, 1560-1707(Oxford, 1980).
- Marshall, J.D. Furness in the Industrial Revolution: an Economic History of Furness (1711-1900) and the Town of Barrow (1757-1897)(Barrow-in-Furness, 1958).
- Marshall, W. The Rural Economy of the West of England(London, 1796, 2 volumes).
- Martin, J.M. 'The Parliamentary Enclosure Movement and Rural Society in Warwickshire', Agric.Hist.Rev., 15(1967), pp.19-39.
- 'The Cost of Parliamentary Enclosure in Warwickshire', in E.L.Jones ed. Agriculture and Economic Growth in England 1650-1815(1967), pp.128-51.
- 'Members of Parliament and Enclosure: A Reconsideration', Agric.Hist.Rev., 27(1979), pp.101-09.
- Mathias, Peter. 'The Social Structure in the Eighteenth Century: a Calculation by Joseph Massie', Econ.Hist.Rev., 2nd ser.X(1957-8), pp.30-45.
- The Brewing Industry in England, 1700-1830 (Cambridge, 1959).
- The First Industrial Nation. An Economic History of Britain 1700-1914(1969).
- 'Capital, Credit and Enterprise in the Industrial Revolution', Jnl.Europ.Econ.Hist., II(1973), pp.121-43.
- Mathias, Peter & Postan M.M.eds. The Cambridge Economic History of Europe, VII(Cambridge, 1978).
- Matthews, R.C.O., Feinstein, C.H. & Odling-Smee, J.C. British Economic Growth 1856-1973(Oxford, 1982).
- Miles, Michael. 'The Money Market in the Early Industrial Revolution: The Evidence from West Riding Attorneys', Bus.Hist., 23, 2(1981), pp.127-46.
- Minchinton, W.E. 'Bristol, Metropolis of the West in the Eighteenth Century', Trans.Roy.Hist.Soc., 5th ser.IV(1954), pp.69-89.
- The British Tinplate Industry. A History(Oxford, 1957).
- The Trade of Bristol in the Eighteenth Century, (Br.Rec.Soc., 1957).
- The Port of Bristol in the Eighteenth Century(Br.Hist.Assoc., 1962).

- Politics and the Port of Bristol in the Eighteenth Century(Br.Rec.Soc.,1963).
- ed. The Growth of Overseas Trade in the Seventeenth and Eighteenth Centuries(1969).
- 'The Slave trade of Bristol with British Mainland Colonies in North America 1699-1770' in R.Anstey & P.E.H. Hair eds. Liverpool, the African Slave Trade, and Abolition(Liverpool,1976).
- Mingay, G.E. English Landed Society in the Eighteenth Century (1963).
- Mitchell, B.R. & Deane, P. Abstract of British Historical Statistics(1962).
- Moir, Esther. Local Government in Gloucestershire 1775-1800, a Study of the Justices of the Peace(Bristol,1969).
- Neale, F. 'Saxon and Medieval Landscapes' in Atthill. Mendip, A New Study(1976),pp.75-101.
- Neale, R.S. 'The Industries of the City of Bath in the First Half of the Nineteenth Century',Proc.Som.Arch.Nat.Hist.Soc.,108(1963-4),pp.132-44.
- Class and Ideology in the Nineteenth Century(1972).
- 'Society,Belief, and the Building of Bath',in Chalklin & Havinden eds. Rural Change and Urban Growth(1974).
- Bath 1680-1850. A Social History: Or a Valley of Pleasure yet a Sink of Iniquity(1981).
- Needleman, L. Regional Analysis(1968).
- Nef, John U. The Rise of the British Coal Industry(1932,2nd imp.,2 vols.).
- O'Brien, Patrick. 'Agriculture and the Industrial Revolution. An Essay in Bibliography and Criticism',Econ.Hist.Rev., 2nd ser.XXX,3(1977),pp.166-81.
- 'European Economic Development: The Contribution of the Periphery',Econ.Hist.Rev.,2nd ser.XXXV,1(1982),pp.1-18.
- Orwin, C.S. & Sellick, R.J. The Reclamation of Exmoor Forest (Newton Abbot,1970).
- Pares, Richard. A West-India Fortune(1950).
- Parnell, Sir Henry. A Treatise on Roads(1838,2nd edn.).
- Parker, R.H. 'A Note on the Use of Accounting Statements by Business Historians',Bulletin of Bus.Arch.Counc.of Australia,I,8(1959-60),pp.39-42.
- Pawson, Eric. Transport and Economy: The Turnpike Roads of Eighteenth Century Britain(1977).
- Payne, Peter L. 'Business Archives and Economic History, the Case for Regional Studies',Archives,VI,29(1963),pp.21-9.
- Pelham, R.A. 'Fourteenth-Century England'in Darby ed. Historical Geography of England(1936),pp.230-65.
- Phelps, W. The History and Antiquities of Somersetshire(2 volumes,1836 & 1839).
- Phillips, A.D.M. & Turton, B.J. 'Staffordshire turnpike trusts and traffic in the early nineteenth century',Jnl.Trans.Hist., 3rd ser.,8,2(1987),pp.126-45.
- Pickford, R. William Smith, Father of English Geology 1769-1839(Bath,1969).
- Pollard, Sydney. 'Investment,Consumption and the Industrial Revolution',Econ.Hist.Rev.,2nd ser.XI,2(1958),pp.215-26.

- The Genesis of Modern Management: A Study of The Industrial Revolution in Great Britain(1965).
'Capital Accounting in the Industrial Revolution', and
'Fixed Capital in the Industrial Revolution in Britain',
both repr. in Crouzet ed. Capital Formation in the Industrial Revolution(1972),pp. 119-161.
'A New Estimate of British Coal Production, 1750-1850',
Econ.Hist.Rev.,2nd ser.XXXIII,2(1980),pp.212-35.
Peaceful Conquest: the Industrialization of Europe 1760-1970(1981).
'Coalmining,1750-1850' & "The Insurance Policies",in
Feinstein & Pollard eds. Studies in Capital Formation
(1988),pp.35-72, 225-56.
- Ponting, K.G. A History of the West of England Cloth Industry
(1957).
The Woollen Industry of South-west England(Bath,1971).
- Powell, J.W.Damer. Bristol Privateers and Ships of War
(Bristol,1930).
- Pressnell, L.S. Country Banking in the Industrial Revolution
(Oxford,1956).
ed. Studies in the Industrial Revolution presented to T.S.Ashton(1960).
- Pressnell, L.S. & Orbell, John. A Guide to the Historical Records of British Banking(1985).
- Proportion Roll of 1742(Somerset Record Soc.,1889).
- Rabb, T.K. Enterprise and Empire: Merchant and Gentry Investment in the Expansion of England,1575-1730
(Harvard U.P.,1767).
- Ralph Elizabeth. Guide to the Bristol Archives Office
(Bristol,1971).
- Raistrick, Arthur. Quakers in Science and Industry...During the Seventeenth and Eighteenth Centuries(Newton Abbot, 1968).
- Raybould, T.J. The Economic Emergence of the Black Country, a Study of the Dudley Estate(Newton Abbot,1973)
'Aristocratic Landowners and the Industrial Revolution: the Black Country Experience c.1760-1840",Midland History IX(1984),pp.59-86.
- Reader, W.J. I.C.I. A History(Oxford,1970).
Macadam. The McAdam Family and the Turnpike Roads,1798-1861(1980).
- Richards, Eric. The Leviathan of Wealth:The Sutherland Fortune in the Industrial Revolution(1973).
'Structural Change in a Regional Economy: Sutherland and the Industrial Revolution,1780-1830',Econ.Hist.Rev.,2nd ser.XXVI,1(1973),pp.63-76.
- Richardson, David. 'Profits in the Liverpool Slave Trade: the Accounts of William Davenport,1757-1784' in Anstey & Hair eds. Liverpool, the African Slave Trade and Abolition (1976).
Bristol, Africa, and the Eighteenth-Century Slave Trade to America(3 vols. I,1698-1729,1986; II,1730-1745,1987; III,1746-69,1991: Br.Rec.Soc.).
- Richardson, Harry W. Elements of Regional Economics(1969).

- Richardson, Philip. 'The Structure of Capital during the Industrial Revolution Revisited: two case studies from the cotton textile industry', Econ.Hist.Rev., 2nd ser. XLII, 4(1989), pp.484-503.
- Robinson, Joan. The Accumulation of Capital(1956).
- Robinson, W.J. West Country Manors(Bristol,1930).
- Robson, Robert. The Attorney in Eighteenth Century England (Cambridge,1959).
- Rogers, K.H. The Newcomen Engine in the West of England (Bradford-on-Avon,1976).
- Wiltshire and Somerset Woollen Mills(Edington,1976),
- Rose, Mary B. 'The Role of the Family in Providing Capital and Managerial Talent in Samuel Greg & Co. 1784-1840', Bus.Hist.XIX,1(1977),pp.37-54.
- 'Diversification of Investment by the Greg Family,1800-1914', Business Hist.,XXI,1(1979),pp.79-96.
- Ross, C.D. 'Bristol in the Middle Ages' in MacInnes & Whittard eds. Bristol and Adjoining Counties(1955),pp.179-92.
- Rowe, John. Cornwall in the Age of the Industrial Revolution (Liverpool,1953).
- Rowlands, Marie B. Masters and Men in the West Midlands Metalware Trades before the Industrial Revolution(Manchester, 1975).
- Sacks, David Harris. Trade,Society and Politics in Bristol 1500-1640(1985,2 vols.).
- Sandberg, Lars G. Lancashire in Decline. A Study in Entrepreneurship, Technology and International Trade(Ohio State U.P.,1974).
- Sanders, Charles Richard. The Strachey Family 1588-1932(Duke U.P.,1953).
- Schofield, M.M. 'The Slave Trade from Lancashire and Cheshire Ports outside Liverpool,c.1750-90', Trans.Hist.Soc.Lancs. & Chesh,CXXVI(1977).
- Schofield, R.S. 'The Geographical Distribution of Wealth in England,1334-1649', Econ.Hist.Rev.,2nd ser.XVIII,3(1965), pp.345-59
- Scott, W.R. The Constitution and Finance of English...Joint Stock Companies to 1720(Cambridge,1909-12,3 vols.).
- Sedgwick, Romney. The House of Commons 1715-54,(1970,2 vols).
- Shapiro, Seymour. Capital in the Cotton Industry in the Industrial Revolution(Cornell U.P.,1967).
- Shelton, George. Dean Tucker and Eighteenth Century Economic and Political Thought(1981).
- Shelton, Walter J. English Hunger and Industrial Disorders: A study of social conflict during the first decade of George III's reign(1973).
- 'The Role of Local Authorities in the Provincial Hunger Riots of 1766', Albion,V,1(1973),pp.50-66.
- Sheridan, R.B. 'The Plantation Revolution and the Industrial Revolution,1625-1775', Caribbean Studies,IX(1969).
- Simpson, A.W.B. An Introduction to the History of the Land Law(Oxford,1961).
- Smith, Adam. An Inquiry into the Nature and Causes of the Wealth of Nations(1775/6,4th edn.1786,3 volumes).

- Smith, Graham. Smuggling in the Bristol Channel 1700-1850 (Newbury, 1989).
- Social Science Research Council, Research in Economic and Social History (1971).
- Souden, David. '"Rogues, whores and vagabonds"? Indentured servant emigration to North America and the case of mid-seventeenth century Bristol' in Clark & Souden eds. Migration and Society (1987).
- Statistical Office of the U.N. Concepts and Definitions of Capital Formation, Studies in Methods, Series F, no.3 (New York, 1953).
- Stephens, W.B. 'Trade Trends at Bristol 1600-1700', Trans. Brist. & Glos. Arch. Soc., XCIII (1974), pp.156-61.
- Stevenson, John. Popular Disturbances in England, 1700-1870 (1979).
- Strachey, John. 'Observations on the Strata in the Coal-mines of Mendip, in Somersetshire', Trans. Roy. Phil. Soc., XXX, 360 (1719), p.968.
'An Account of the Strata in Coal-mines etc.', Trans. Roy. Phil. Soc., XXXIII, 391 (1725), p.395.
- Summers, Dorothy. The Great Level: Land Drainage and Reclamation in the Fens (Newton Abbot, 1976).
- Supple, Barry. 'Economic History in the 1980s, Old Problems and New Directions', Jnl. Interdisc. Hist., XII (1981), pp.199-205.
- Tasker, John. General Turnpike Acts, an alphabetical arrangement with notes (1831).
- Tate, W.E. Somerset Enclosure Acts and Awards (Frome, 1948).
- Tawney, R.H. The Agrarian Problem in the Sixteenth Century (1912).
- Temin, Peter. 'Economic History in the 1980s, The Future of the New Economic History', Jnl. Interdisc. Hist., XII, 2 (1981), pp.179-97.
- Thirsk, Joan. 'Industries in the Countryside' in F.J. Fisher ed. Essays in the Economic and Social History of Tudor and Stuart England (Cambridge, 1961).
Economic Policy and Projects: The Development of a Consumer Society in Early Modern England (Oxford, 1978).
The Rural Economy of England (1984).
- Thompson, F.M.L. English Landed Society in the Nineteenth Century (1962).
'The Social Distribution of Landed Property in England since the Sixteenth Century', Econ. Hist. Rev. 2nd ser. XIX, 3 (1966), pp.505-17.
Chartered Surveyors, the Growth of a Profession (1968).
- Tomlins, T.E. The Law Dictionary...Defining and Interpreting the Terms or Words... (1809).
- Torrens, Hugh. The Evolution of a Family Firm: Stothert and Pitt of Bath (Bath, 1978).
- Trinder, Barrie. The Industrial Revolution in Shropshire (1973).
- Tucker, G.S.L. Progress and Profits in British Economic Thought, 1650-1850 (Cambridge, 1960).
- Tucker, Josiah. A Brief Essay on Trade (1753, 3rd edn.).
- Turnbull, G.L. 'Canals, Coal and Regional Growth during the

- Industrial Revolution', Econ.Hist.Rev., 2nd ser.XL, 4(1987), pp.537-60.
- Turner, Michael. 'The Cost of Parliamentary Enclosure in Buckinghamshire', Agric.Hist.Rev., 21(1973), pp.35-46.
- 'Parliamentary Enclosure and Landownership Change in Buckinghamshire', Econ.Hist.Rev., 2nd ser.XXVIII, 4(1975), pp.565-81.
- ed. W.E.Tate, A Domesday of English Enclosure Acts and Awards(Reading, 1978).
- English Parliamentary Enclosure: its Historical Geography and Economic History(Folkestone, 1980).
- 'Cost, Finance, and Parliamentary Enclosure', Econ.Hist.Rev., 2nd ser.XXXIV, 2(1981), pp.236-48.
- Enclosures in Britain 1750-1830(1984).
- Vanes, Jean.. The Ledger of John Smyth 1538-1550(1974).
- Victoria History of the Counties of England: Somerset(two vols. 1911; later vols. 1974, 1978, 1985).
- Waldegrave, The Earl. 'James McMurtrie of Radstock 1839-1914', Proc.Som.Arch.Nat.Hist.Soc., 114(1970), pp.27-36.
- Walker, Frank. The Bristol Region(1972).
- Walters, Rhodri. 'Capital Formation in the South Wales Coal Industry, 1840-1914', Welsh Hist.Rev., X(1980), pp.69-92.
- Ward, J.R. The Finance of Canal Building in Eighteenth-Century England(Oxford, 1974).
- 'Speculative Building at Bristol and Clifton, 1783-1793', Bus.Hist., XX, 1(1978), pp.3-18.
- 'The Profitability of Sugar Planting in the British West Indies, 1650-1834', Econ.Hist.Rev., 2nd ser.XXXI, 2(1978), pp.197-213.
- Ward, J.T. & Wilson, R.G.eds. Land and Industry, the Landed Estate and the Industrial Revolution(Newton Abbot, 1971).
- Warner, R. A Walk through some of the Western Counties of England(Bath, 1800).
- Weatherill, Lorna. The Pottery Trade and North Staffordshire 1660-1760(Manchester, 1971).
- 'Capital and Credit in the Pottery Industry before 1770', Bus.Hist., XXIV, 3(1982), pp.243-58.
- Webb, Sydney & Beatrice. English Local Government: The Story of the King's Highway(1913, repr.1963).
- English Local Government: Statutory Authorities for Special Purposes(1922, repr.1963).
- Weiller, Kenneth J. & Mirowski, Philip. 'Rates of Interest in Eighteenth Century England', Expl.Econ.Hist., 27(1990), pp.1-28.
- Willan, T.S. River Navigation in England, 1600-1750(Oxford, 1936).
- 'Bath and the Navigation of the River Avon', Proc.Bath Branch Som.Arch.Nat.Hist.Soc.(1936), pp.139-40.
- English Coasting Trade, 1600-1750(Manchester, 1938, repr. 1967).
- Williams, Dale E. 'Morals, Markets and the English Crowd in 1766', Past and Present, CIV(1984), pp.56-73.
- Williams, David M. 'The Shipping and Organization of the Atlantic Slave Trade: a Review Article', Jnl.Trans.Hist.,

- 2nd ser.IV,3(1977-8),pp.179-84.
- Williams, Eric. Capitalism and Slavery(1944,3rd imp.1972).
- Williams, J.E. 'Whitehaven in the Eighteenth Century',Econ. Hist.Rev.,2nd ser.VII(1956),pp.393-404.
- Williams, L.A. Road Transport in Cumbria in the Nineteenth Century(1975).
- Williams, Michael. 'The 1801 Crop Returns for Somerset',Proc. Som.Arch.Nat.Hist.Soc.,113(1969),pp.69-85.
The Draining of the Somerset Levels
(Cambridge,1970).
'The Enclosure and Reclamation of the Mendip Hills,1770-1870',Agric.Hist.Rev.,19(1971),pp.65-81.
'The Enclosure of Waste Land in Somerset,1700-1900',Trans.Inst.Brit.Geogs.,57(1972),pp.99-124.
- Wilson, Charles. The History of Unilever. A Study in Economic Growth and Social Change(1954,2 vols.)
'Transport as a Factor in the History of Economic Development',Jnl.Europ.Econ.Hist.,II.2(1973),pp.320-37.
- Wilson, P.N. 'The Gunpowder Mills of Westmorland and Furness',Trans.Newc.Soc.,XXXVI(1963-4),pp.47-65.
- Wilson, R.G. 'Transport Dues as Indices of Economic Growth',Econ.Hist.Rev.,2nd ser.XIX,1(1966),pp.110-23.
Gentlemen Merchants. The Merchant Community in Leeds,1700-1830(Manchester,1971).
'The Supremacy of the Yorkshire Cloth Industry in the Eighteenth Century' in Harte & Ponting eds. Textile History and Economic History(1973).
- Wingrove, Benjamin. Remarks on a bill now before Parliament to amend the general laws for regulating turn-pike roads; in which are introduced strictures on the opinions of Mr McAdam on the subject of roads(Bath,1821).
- Wolper, Roy S. 'The Rhetoric of Gunpowder and the Idea of Progress',Jnl.Hist.Ideas,XXXI(1970),pp.589-98.
- Wood, Adrian. A Theory of Profits(Cambridge,1975).
- Wright, Joseph ed. The English Dialect Dictionary(Oxford,1898).
- Wrigley, E.A. 'The Supply of Raw Materials in the Industrial Revolution',Econ.Hist.Rev.,2nd ser.XV,1(1962),pp.1-16.
'A Simple Model of London's Importance in Changing English Society and Economy,1650-1750',Past & Present,37(1967),pp.44-70.
- Wrigley, E.A. & Scofield R.S. The Population History of England 1541-1871:a reconstruction(1980).
- Yamey, B.S. 'Notes on Double-entry Bookkeeping and Economic Progress',Jnl.Europ.Econ.Hist.,4(1975),pp.717-23.
- Yamey, B.S., Edey, H.C. & Thomson, H.W. Accounting in England and Scotland 1543-1800(1963).
- Zupko, Ronald Edw. A Dictionary of English Weights and Measures from Anglo-Saxon Times to the Nineteenth Century(Wisconsin U.P.,1968).

THE EVOLUTION OF THE ENGLISH TURNPIKE TRUSTS: LESSONS FROM A CASE STUDY

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The Evolution of the English Turnpike Trusts: Lessons from a Case Study

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The demythologizing of transport studies begun in recent years has shifted attention from an interest in individual undertakings towards a broader and more systematic analysis of transport developments in relation to the national economy. This move towards "the New Transport History: a subject which has escaped from antiquarianism and narrative"² may make the present return to a narrow focus seem retrograde, even wilful. Such an unfashionable step can, however, be justified on the ground that only through the analysis of comprehensive evidence on discrete ventures can the oversimplifications and distortions underlying some national assessments be revealed. In particular, it can be demonstrated from a study of the Bath Turnpike Trust that although the periodic renewal and amendment Acts pertaining to individual trusts have been almost entirely ignored in recent macro-studies, they were vitally important for the development of each undertaking and hence for the road system as a whole.³ Through this legislation the trusts were able to renew and extend their initial powers for raising capital, collecting revenue, and building and improving the roads. That is, they did not emerge fully fledged at the moment of legal inception, but were instead subject to a continuing evolution within a network which was itself undergoing change. Generalizations which fail to take into account this acquisition of additional powers by existing bodies are therefore likely to misrepresent the contributions of turnpike roads in terms of both capital investment and construction work.

This view of the turnpike trusts as dynamic rather than static bodies will be examined as follows. After a short survey of the relevant literature, the typicality of the Bath Trust will be considered, and the provisions of its renewal and amendment Acts summarized. The implementation of powers relating to mileage can be easily established, and will therefore be described briefly. Provisions concerning finance present more difficulty and will be studied at greater length. It will be shown that their significance lies not only

¹ I am grateful for the help received from Mr D. J. Johnson of the House of Lords Record Office (H.L.R.O.), Mr D. M. M. Shorrocks of the Somerset Record Office (S.R.O.), Mr R. Bryant, formerly of the Bath Guildhall Archives (B.G.A.), Miss M. E. Williams of the Bristol Archive Office, and their colleagues, and the staff of the Bath Reference Library. I should like to thank R. Angus Buchanan for his helpful criticism.

² T. C. Barker in a review of Derek H. Aldcroft and Michael J. Freeman, eds. *Transport in the Industrial Revolution* (Manchester, 1983), in *Journal of Transport History*, 3rd ser. 5 (1984), p. 99.

³ It is convenient to refer to all legislation subsequent to that which established a trust as renewal and amendment Acts, but this general practice is not entirely satisfactory for although Acts renewing general powers of the trusts (usually at intervals of 21 years) frequently included clauses amending their scope, such changes could also be secured through Acts which were not part of this recurring pattern.

in the possibility of a more accurate measurement of the capitalization of a turnpike trust than has hitherto been available, but also in the novel insights they provide into previously unexplored aspects of a regional capital market.

I

Two important studies of the turnpike road system on a national basis were published in the 1970s, the first works of substance on this theme since the accounts by the Webbs and W. T. Jackman some sixty years earlier. These were by William Albert and Eric Pawson, and although there is some overlap since both are set within the context of organization and administration, each breaks new ground in relation to a different aspect of the turnpike trusts.⁴ Pawson is particularly concerned with the spatial distribution and density of the turnpike network, as well as with the diffusion of this innovation through time.⁵ In contrast, a special feature of Albert's work is his concern with the financing of the turnpike roads, particularly the relationship between the level of trust investment and the prevailing rates of interest.⁶ The success of these attempts to place the construction and financing of the turnpike roads on a more systematic footing is, however, limited by the fact that each is based upon the Acts of Parliament which established the trusts, and not upon those which renewed and extended original powers. This subsequent legislation does not pass unnoticed, but the references serve only to emphasize the element missing from the authors' analysis. Thus, although Pawson notes that over one-third of such Acts passed before 1770 "added extra mileage to their respective trusts, the average amount being anything from five to fifteen miles, decade by decade", his figures and tables are based only on the new trusts.⁷ Similarly, Albert observes that "Some renewal acts placed additional roads under the trustees' jurisdiction", but nevertheless concludes that "trust investment will be measured by the number of new acts passed in each year".⁸ These omissions mean that the authors' conclusions relate only to the simple changes arising from the creation of new trusts, and exclude the more complex ones associated with the evolution of the system as a whole. The effect of this serious limitation is minimized by the self-contained nature of the two books, but in a third, general, study the problem is greater, for the similarly flawed

⁴ Sidney and Beatrice Webb, *English Local Government: The Story of the King's Highway* (1913); W. T. Jackman, *The Development of Transportation in Modern England* (1916); William Albert, *The Turnpike Road System in England, 1663-1840* (Cambridge, 1972); Eric Pawson, *Transport and Economy: the Turnpike Roads of Eighteenth-century Britain* (1977).

⁵ Pawson, *Transport and Economy*, pp. 137-60.

⁶ Albert, *Turnpike Road System*, pp. 120-31.

⁷ Pawson, *Transport and Economy*, p. 105. Pawson's statement that "Renewal Acts are unfortunately available in manuscript form only", 'Turnpikes and their Traffic: An Agenda for Research', *Journal of the Railway and Canal Historical Society*, 27 (1983), p. 181, is inaccurate. These Acts are available in printed form in the Parliamentary sessional volumes, and at county record offices. I should like to thank Mr D. J. Johnson of the H.L.R.O., Mr D. M. M. Shorrocks of the S.R.O., Mr K. H. Rogers of the Wiltshire Record Office, and Mr C. Cox, historian of the Gloucestershire trusts, for their advice on this point.

⁸ Albert, *Turnpike Road System*, pp. 121-2. In his later review of 'The Turnpike Trusts' in Aldcroft and Freeman, eds. *Transport in the Industrial Revolution*, Albert still uses the "new turnpike Acts as a measure [of the] growth of the system", but he now warns that "Although the number of turnpike Acts is often taken as an indicator of investment it is at best an indifferent measure", pp. 36-8.

conclusions reached by John Ginarlis in his unpublished thesis of 1970 have since formed the basis for estimates of capital formation in the turnpike roads in a major, influential work by another scholar, C. H. Feinstein.⁹

Ginarlis based his estimates of investment from 1750 to 1830 upon a backward extrapolation from the established figures for 1822-32, which he justified by evidence taken from a sample of trusts, and on the assumption that "trust mileages had remained constant over the period 1750-1822 and that expenditure patterns similar in the 1820s did not change from 1750".¹⁰ The whole scheme founders on the weakness of this key assumption, which can be invalidated by reference to the same local studies which the author cited in support of his contention.¹¹ Thus G. H. Tupling was cited despite his observation that even at a time when no fresh authorities were being created in Lancashire, "several already in existence obtained powers to take over additional lengths of road".¹² Ginarlis also refers to F. H. Maud's work on the Hockerill Highway, although this too reveals the importance of changes over the years, such as those arising from the renewal Act of 1791 which authorized a new road, cut in the early 1800s.¹³ The two studies of London trusts cited by Ginarlis provide further evidence with which to refute his assumption. P. L. Payne's account of the Bermondsey and Rotherhithe Trust founded in 1748 describes, for example, the authorization of a new road in 1798, for which an initial sum of £1,950 was borrowed. Powers to amend a second line were granted in 1803, and this work was still proceeding in 1810, by which time costs had reached £6,468.¹⁴ C. A. A. Clarke's study of the Islington and Marylebone Trusts, founded in 1716 and 1721 respectively, details the importance of their joint work on the New Road along the line of the present Marylebone, Euston, and Pentonville Roads. In the first three years after its authorization in 1756 the Marylebone Trust spent over £4,000 on the stretch for which it was responsible.¹⁵ Indeed, investment costs were so high that in the table of trust expenditure compiled by Pawson the New Road tops the list at £1,594.9 per mile.¹⁶

Not only do the case studies undermine Ginarlis's assumption, but also open to further criticism is the sample of trusts he used to provide guidance in the exercise of extrapolation from the evidence of the 1820s back over the uncertain years to the 1750s. The distortions likely to arise from the false

⁹ J. E. Ginarlis, 'Road and Waterway Investment in Britain, 1750-1850' (unpublished Ph.D. thesis, University of Sheffield, 1970); C. H. Feinstein, 'Capital Formation in Great Britain', in Peter Mathias and M. M. Postan, eds. *Cambridge Economic History of Europe*, VII, *The Industrial Economies: Capital, Labour and Enterprise*, pt. I (Cambridge, 1978), pp. 59-60.

¹⁰ Ginarlis, 'Road and Waterway Investment', pp. 102-15. There is a lack of firm evidence at both ends of the process of extrapolation. Figures for 1822-32 were for half the counties based on an average from the Parliamentary Returns for 1822 and 1829 (p. 78). Those for 1750-1 were available for only three trusts out of the guiding sample of 55, and as each of the three had been founded before 1750 they cannot be regarded as providing 'original outlay figures' for that year (Tables XI and XII, pp. 116-21).

¹¹ *Ibid.* p. 103.

¹² G. H. Tupling, 'The Turnpike Trusts of Lancashire', *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, xciv (1953), p. 43.

¹³ F. H. Maud, *The Hockerill Highway* (Colchester, 1957), pp. 27-9.

¹⁴ P. L. Payne, 'The Bermondsey, Rotherhithe and Deptford Turnpike 1776-1810', *J. Trans. Hist.* II (1956), pp. 138-9, 142 n. 52.

¹⁵ C. A. Allen Clarke, 'The Turnpike Trusts of Islington and Marylebone from 1700-1825' (unpublished M.A. thesis, University of London, 1955), pp. 35-8, 200, 217, 229.

¹⁶ Pawson, *Transport and Economy*, pp. 231-3.

assumption of a constancy of mileage and expenditure patterns over the years may be illustrated by a brief account of the growth of one of the trusts in the sample: the Wells Trust, a neighbour of the Bath roads which was set up in 1753.¹⁷ It had powers to turnpike 26.25 miles on three lines of road, increased in 1763/4 to 39.0 miles by the undertaking of a fourth road. A further extension of nine miles was authorized in 1778/9, although twenty years later this stretch was transferred to the Taunton Trust. In 1821 the Wells roads underwent further reorganization. Several deviations were authorized and powers over one section were repealed, with the result that by the end of the 1820s the network had stabilized at 37.0 miles. The mature body was thus more than 40 per cent larger than the new trust of the 1750s, yet it was the figure for the later years, derived from the Parliamentary Papers for the later 1820s and 1830s,¹⁸ which was used by Ginarlis as an indicator of the earlier mileage of this and other trusts in the sample.

Enough evidence has now been quoted to establish the importance of the point here being made: namely, that the renewal and amendment Acts played a significant role in the developing profile of each trust, and that their neglect inevitably produces distortions in the national picture. Unfortunately these cannot be corrected simply by consulting work already published on individual trusts, for the authors of such case studies have so far proved as reluctant to investigate the growth of mileage and investment in the roads as have the compilers of macro-studies. For example, W. G. Dodds's account of the development of the Northumberland turnpikes, in which trusts first turnpiked well-used roads and later developed special lines to meet the needs of new commercial and industrial enterprises, is based on impressions rather than analysis, for the author admitted that "exact mileage at any one time seems to be almost impossible to calculate—owing to administrative complexities".¹⁹ In J. M. L. Booker's study of the Essex turnpikes he declared that the "structure of administration" should be "examined against the background of toll roads increasing in length and complexity", though he made no attempt to calculate the magnitude of the changes involved.²⁰ Whilst confirming the dynamic nature of the turnpike trusts, therefore, both of these examples reveal also the lack of precision to be found in the traditional approach. The following account is an attempt to remedy those deficiencies hitherto to be found in both micro- and macro-level studies, by analysing the evolution of the Bath Turnpike Trust as authorized by its renewal and amendment Acts, particularly as they affected mileage and investment.

II

In the course of its history the Bath Trust exhibited many of the different and changing characteristics which formed the general features of such bodies

¹⁷ For papers of the Wells Trust see S.R.O. D/T/wel.

¹⁸ In particular H.L.R.O., H.L. Sess. Papers 81 and 24 (1833), CCCXXIII, p. 1 *et seq.* *Report of the House of Lords Select Committee to examine the Turnpike Returns, and the Abstract thereof.* Ginarlis's citation of this source is misleading for the Parliamentary Papers to which he refers (thesis, p. 102 n. 2, 'P.P. 1833, H.O.L. Vol. x, B.M.') do not contain mileage figures for individual trusts.

¹⁹ W. G. Dodds, 'The Turnpike Trusts of Northumberland' (unpublished M.A. thesis, University of Durham, 1965), pp. 261, 45 n. 86.

²⁰ J. M. L. Booker, 'The Essex Turnpike Trusts' (unpublished M.Litt. thesis, University of Durham, 1979), pp. 32, 216 n. 5.

over the years. In the matter of timing, for example, although established in 1707, one of the earliest bodies,²¹ the Bath Trust was substantially reformed in 1757 and may therefore be included in the 'turnpike boom' of the 1750s and 1760s.²² Its administrative arrangements too span the divide between the earlier and later trusts. For the first fifty years it functioned as a Justice Trust under a small number of commissioners drawn from the area it served: the nearer parts of Somerset, Wiltshire, and Gloucestershire, and the city of Bath. At its mid-century reorganization these duties were transferred to trustees, of whom some 400 were listed by name or office. The Trust thus adopted the practice, which had been emerging since the second decade of the eighteenth century, by which these bodies were run by men representative of the economic life of the area, rather than as part of the county administration.

In its physical features the Bath Trust straddles the usual classifications. It is generally referred to as one of the 'town-centred' trusts of the west country which functioned chiefly in relation to an active provincial centre, rather than as part of the system of 'linear' trusts whose roads led to London.²³ But these roles were not mutually exclusive, and the Bath Trust can be shown to have acted in both capacities. Thus although the initial legislation authorized the turnpiking of seven roads leading into the city, the only one of outstanding importance at the time was the London Road which formed part of one of the great roads from the west country to the capital. In 1707 this section of the Bath Roads represented 40 per cent of the Trust's total mileage, and although this proportion declined as Bath flourished as a regional centre and its other roads were extended, so that by the 1820s it formed only 10 per cent of the total, yet the London Road retained its importance in terms of revenue. In the later 1820s, as in the 1800s and in the 1750s, approximately one-third of the annual income from the tolls came from the London Road.²⁴ Comparisons of total mileage are difficult because trusts varied so much at different stages of growth, but in this matter too the Trust was fairly typical, for when fully formed at about 50 miles it constituted neither one of the few large trusts of over 100 miles, nor one of the small number of 10 miles or less.

In the course of its life history, therefore, the Bath Trust exhibited features which allow it to be considered as representative of its kind. In view of this generalization, and because of the fortunate survival of a good collection of archival material, it is reasonable to treat the documentary evidence relating to this body with some confidence, as revealing not only the way the Bath Trust changed in response to legislation, but also by suggesting the possible effect of a similar sequence of Acts upon the evolution of other trusts.

The roads of the Bath Trust built up gradually from the 12.5 miles authorized in 1707 (6 Anne c.42) to 14.75 miles in 1721 (7 Geo. I c.19), 20.15 miles in 1739 (12 Geo. II c.20), 31.2 miles in 1757 (30 Geo. II c.67), 41.05 miles in 1759 (32 Geo. II c.51), and 47.9 miles in 1761 (1 Geo. III c.31). It

²¹ For chronological lists of new trusts see Albert, *Turnpike Road System*, pp. 201-23 and Pawson, *Transport and Economy*, pp. 341-60.

²² Albert, *Turnpike Road System*, pp. 49-52 and Pawson, *Transport and Economy*, pp. 122-7, 150-8.

²³ Albert, *Turnpike Road System*, pp. 44-9, 202 and Pawson, *Transport and Economy*, pp. 136-45.

²⁴ S.R.O. 1707/8, 6 Anne c.42; D/T/ba, Minute Book 6, 30 March 1758, Min. Bk. 9, 20 Feb. 1802; Quarter Sessions Records (Q/R), Turnpike Trust Returns for 1820 and General Statement of Account for 1829.

fluctuated thereafter at around 50 miles, for the Acts of 1793 (33 Geo. III c.144) and 1829 (10 Geo. IV c.cx) were concerned with the construction of new roads as major deviations rather than as extensions of mileage. Surveys undertaken by the Trust indicate an estimated 48.25 miles in 1776, and measured lengths of 52.0 miles in 1787, 47.7 miles in 1791, and 49.19 miles in 1813. Later surveys in response to Parliamentary initiative established measures of 49.4 miles in the early 1820s, and 48.47 miles at the end of the decade.²⁵ Two years after the expiry Act of 1876 (39/40 Vict. c.39) the authority of the Trust ceased.

These Acts of Parliament also contained provisions which permitted the raising of funds in a financial market and the levying of tolls on road users. From the practice of the trustees it can be suggested that in general the former provided the long-term capital of the Trust (invested in new and improved roads with their attendant Parliamentary and legal costs) and the latter its current revenue (spent on road repairs, administration, and interest payments). In Table 1 the evidence has been classified accordingly for the years from the mid-eighteenth century (before which there is no known relevant material), to the early 1830s, after which the compilation of statistics at the national level renders such information generally available.²⁶ Column 1 confirms the

Table 1.

Sources: Acts of Parliament and papers of the Bath Turnpike Trust especially the following: S.R.O. D/T/ba, 5, Trustees' Subscription Book to Oaths of Qualification, 1793-1851; 6-12, minute books for 1757-1854; 15, Proceedings of sub-committee for the London Road, 1757-62; 18, Register of Mortgages of Tolls, 1760-82; 19, Register of Mortgages of Tolls, 1801-16; 20, Abstract of Title to Mortgages of Tolls, 1857; 26-40, administrative and financial records relating to receipts from tolls and expenditure on roads; 41, Lists of Creditors for 1785 and 1805; 42, Deeds of mortgage, assignment, declaration etc., 1758-1849. S.R.O. Q/R Turnpike Trust Returns for 1820 and General Statements of Account, 1822-50.

Notes:

- Year: The Trust's accounting system was irregular and therefore figures in Col. 4 cover calendar years (1770-6, 1803-5), years ending in spring (1757-8, 1798-1802, 1807-9, 1816-22), and in autumn (1790-2, 1811-6, 1823-33). All other figures in the table are for calendar years.
- Col. 1: Capital authorized by Act of Parliament, here shown cumulatively.
- Col. 2: Capital raised on the security of the tolls. Figures before 1823 have been reconstituted from mortgage deeds, minute books, and financial papers. Later figures are from the annual General Statements of Account. Unsecured loans from the Trust's bankers after their appointment in 1808 are not included.
- Col. 3: The cumulative mortgage debt. Figures before 1823 have largely been calculated from additional borrowings minus repayments (undertaken on a regular basis by ballot after 1810, when 5% of the tolls was reserved annually of this purpose). The incorporation of firm evidence for 1772, 1806, 1810 (minute books), 1785, 1805 (lists of creditors), and 1820 (Quarter Sessions records), show the calculations are of the right order. Figures from 1823 are from the annual General Statements of Account.
- Col. 4: Income received for the use of the roads, including tolls, payments for overweight, and compositions. These are gross sums, including costs of collection (about £250 p.a. in the 1770s, £400 p.a. in the early 1800s) except when tolls were farmed, and a net figure is then shown. Changes in the scope or rate of toll (shown by an asterisk) had an uncertain effect. In 1829 for example, the imposition of multiple tolls on certain roads, and of charges on draught animals individually instead of on vehicles as a unit, was followed by a sharp fall in the revenue.

²⁵ S.R.O. D/T/ba, Min. Bk. 8, Summary of Accounts 1770-6, 7 July 1787, 5 Nov. 1791; Min. Bk. 10, 20 Nov. 1813; Q/R Turnpike Trust Returns for 1820. H.L.R.O., H.L. Sess. Papers 81 and 24 (1833) CCCXXIII, pp. 204-5, Returns for 1829.

²⁶ W. J. Reader, *MacAdam: The MacAdam Family and the Turnpike Roads, 1798-1861* (1980), p. 230, Table 5: Finances of the Bath Trust, 1830-53, provides a relevant example of the use of these printed sources. In the years which overlap with Table 1 of the present study, discrepancies arise largely from differences of interpretation. For example, Reader includes county allowances for bridge repairs within the income from tolls, from which category they are excluded in Table 1.

Table 1. *The Long-term Capital and Current Revenue of the Bath Turnpike Trust, 1757-1833*

Year	1 Capital authorized £	2 Capital raised £	3 Long-term capital £	4 Current revenue £	Year	1 Capital authorized £	2 Capital raised £	3 Long-term capital £	4 Current revenue £
1757*	12,000			1,262	1808		350	21,450	8,107 net
1758		12,000		1,683	1809		600	22,050	8,131 net
1759	19,000		12,000		1810*	30,000	2,300	22,100	
1762		800	12,800		1811		150	23,876	10,480
1764			12,000		1812		450	23,834	9,840
1770				4,451	1813		500	23,872	9,954 net
1771				4,524	1814		750	24,135	9,740
1772		500	12,500	4,470	1815		300	23,905	10,600
1773*		4,500	17,000	4,261	1816		100	23,457	10,960
1774*				4,365	1817		200	23,108	10,968
1775				4,520	1818			22,552	11,880 net
1776				4,872	1819		2,000	23,901	11,810 net
1779		2,300	17,000		1820			24,129	11,989 net
1785			17,000		1821		100	23,629	11,999 net
1790		200	17,200	5,859 net	1822*	limit removed		23,029	11,999 net
1791		800	18,000	6,889 net	1823		900	23,579	12,240
1792				7,151 net	1824		4,850	28,279	14,530
1793*	25,000	1,000	19,000		1825			28,279	14,119
1798				7,415	1826			28,279	14,498
1801		1,100	20,100		1827			24,679	13,764
1802		100	20,200	7,556 net	1828			23,929	15,870
1803				7,935	1829*			23,379	15,030
1804				7,794	1830		6,500	29,779	10,935
1805		100	20,700	7,850	1831		13,700	43,079	11,101
1806		600	20,200		1832		2,800	45,629	11,625
1807		500	21,100	8,520 net	1833		1,200	46,679	10,869

growth of the fund-raising powers of the Trust, for it shows that the permitted level of borrowing was increased from £12,000 in 1757 to £19,000 in 1759, £25,000 in 1793, and £30,000 in 1810. Before the 1750s the limit was £3,000. After the General Turnpike Act of 1822 (3 Geo. IV c.126) all limits were removed.

Detailed evidence on the implementation of such financial powers by this and other turnpike trusts is extremely difficult to come by. Ginarlis surveyed the account books of 55 trusts in pursuit of an estimation of capital formation in the turnpike roads, but was quite unable to unravel the confusion between capital funds and current revenue, construction and administrative costs, to be found in those rare accounts which do survive.²⁷ For the Bath Trust not even this unsatisfactory source is available, but fortunately its mortgage deeds have survived in such unusual profusion as to make possible a reconstitution of its finances. The fact that no comparable body of information for any other trust is available now, or possibly in the future because of the paucity of source material and the difficulty of its reconstitution, means that the case of the Bath Trust is of special significance for the whole study of the turnpike roads.

The long-term capital of the Bath Trust was raised largely on the security of its assets by a process which helped to develop the concept of the "mortgage" beyond its landed origins. There were essentially two forms of the mortgage deed of the Trust. Before 1793 the tolls formed the only security, and these were assigned to three landed trustees. Each mortgagee had "all the Right Title and Interest in and to the said Tolls". After 1793 (33 Geo. III c.144) the security offered was extended to include the tollhouses and turnpikes, of which the mortgagee was now promised the same proportion as the sum advanced bore to the whole sum subscribed. Also, the tolls were now assigned to any seven trustees, amongst whom local townspeople became dominant. The fact that in both cases the mortgagee had equal rights against the securities offered, regardless of the date of individual deeds, facilitated the raising of capital, for it meant that trustees could borrow at any time without creating a special mortgage²⁸ whilst new lenders had the advantage of equal status with earlier investors. These funds assumed the permanence associated with share capital rather than a loan, although this apparent stability concealed a remarkable degree of flux as individual deeds changed hands with ease in a secondary market which flourished alongside the primary one.

The mortgage deeds have survived because when paid off they were stored in bundles according to their final ownership. Within these bundles each deed carries its own distinctive history, for the details on its face show its nominal value, date of issue, and name and style of the first purchaser, whilst the endorsements record details of its subsequent changes of ownership. From this evidence, supplemented by the minute books, registers of mortgages of tolls, and lists of creditors,²⁹ it has proved possible to trace back through the

²⁷ Ginarlis, 'Road and Waterway Investment', pp. 28-36.

²⁸ The sum of £7,000 authorized in 1759 was at first referred to as a "Second Mortgage", but this usage did not persist after 1763, and the form of the mortgage deed was not changed.

²⁹ S.R.O. D/T/ba, Box 42, Deeds of mortgage, assignment, declaration etc. relating to mortgaging of tolls, 1758-1849; Min. Bks. 6-12, for years 1757-1854; 18, Register of Mortgages of Tolls, 1760-82; 19, Register of Mortgages of Tolls, 1801-16; 41, Lists of Creditors for 1785 and 1805.

network of transactions in the secondary market to the primary holdings of these financial instruments, and so to establish the stages by which the Bath Trust met its capital requirements from the mid-eighteenth century to the early 1830s. This evidence, set out in columns 2 and 3 of Table 1, confirms that the financial powers conferred by the renewal and amendment Acts were implemented, but it also reveals that for most of the period the process was a gradual one.

III

The pace at which capital was raised by the Bath Trust was determined in part by the timing of demand within the context of changing economic circumstances and practical needs, and in part by factors affecting the supply of capital. In terms of the gap between the authorization and implementation of the Trust's powers seen in Table 1, the latter were of possibly greater significance, since it may be argued that whilst the demands for capital were launched by the trustees at what were judged to be propitious times its supply was determined by forces largely outside their control. In particular, the "disinterested" character of many investors seeking financial rather than economic returns, and the vitality of the secondary market which deflected funds from primary investment, both served to delay the raising of new capital.

The first point to establish about the structure of investment is the limited involvement of the trustees, for only 5 per cent of those elected and 10 per cent of those qualified played any part in the financing of the Trust,³⁰ and their role was not paramount. Although they provided about 80 per cent of the capital raised at the mid-eighteenth century reorganization of the Trust and during the difficult first decade of the nineteenth century, against this must be set the much lower level of participation in the intervening and following years, for which the nadir was 1773 when only 25 per cent of the £4,500 then invested came from trustees. This involvement was also generally shortlived. For example, 70 per cent of the capital sum of £12,000 raised in the late 1750s had been sold in the secondary market within twelve years, the transactions through which this was achieved reducing the participation of the trustees from the 80 per cent already noted, to 40 per cent. This was a continuing pattern, for the secondary market was dominated by non-trustees to the extent of the purchase by them of 73 per cent of the securities sold in the period studied. The outcome of this reluctance to invest except in special cases, coupled with the subsequent process of disinvestment, is revealed in two lists of creditors which show that in 1785 the qualified trustees formed 28.8 per cent of that body holding 33.8 per cent of the debt, and in 1805 they formed 33.3 per cent, holding 36.7 per cent of the debt. The hybrid nature of this evidence, which blends together holdings built up in both the primary and secondary markets, may limit its usefulness in some ways, but not in

³⁰ S.R.O. D/T/ba. Acts of Parliament, Minute Books, and the Trustees' Subscription Book to Oaths of Qualification 1793-1851, all combine to show that between 1757 and 1829, 1,612 men were elected as trustees, of whom only 781 (48%) qualified to act in that capacity, sometimes after a lapse of up to 20 years.

relation to the important concept of the capital which sustained the undertaking. In this respect it may be said that the trustees held about only one-third of the continuing capital of the Trust.

This low level of participation is puzzling, until it is recognized that the financial option involved certain disadvantages which may be illustrated from the case of one of the wealthiest trustees, Ralph Allen. In 1759, and again in 1761, he offered £1,000 on the security of the tolls provided £700 could be earmarked for the road convenient to his estates, which included the stone mines at Combe Down as well as the great house at Prior Park. But the investment of funds did not guarantee control of their use, and the offer was withdrawn when it was ruled that new capital had first to be applied to projects specified by Act of Parliament.³¹ Other trustees found that their own economic interests were better served by a practical involvement with the roads, as may be seen from the success of Jacob Mogg. This prosperous coal master from the High Littleton-Farrington Gurney area made no financial investment, but after taking the oath in 1761 he was for 45 years responsible for the construction and maintenance of a new road to the south-west which linked up with the Wells and Bristol Trusts at Rush Hill.³² For an entrepreneur with better alternative uses for his capital, this input of time may well have stood in lieu of a financial investment. It certainly produced a real economic return, for the new road enabled coal from Jacob Mogg's land-locked mines to be transported more easily to the important market in Bath, thus providing a happy coincidence of private profit and public benefit.

The second group whose financial involvement was limited was the landed interest, for despite strong economic motives, and contrary to the usual generalizations,³³ they were not major investors in the Trust. Indeed, their position was a declining one, for although they held 27.4 per cent of the debt in 1785 when they formed 28.8 per cent of the creditors, by 1805 they held only 6.5 per cent and represented 17.5 per cent of that body. In the absence of a sustained involvement by either the trustees or the landed interest, the role of the small urban saver became crucial to the Bath Trust. The term 'small' is used advisedly because in 1785 86.5 per cent of the creditors had holdings of £500 or less, amounting to 52.3 per cent of the whole in value; in 1805 80.7 per cent held £500 or less, amounting to 39.9 per cent of the whole. In both years only some 7.0 per cent held £1,000 or more, representing one-third of the total sum. The main difference between the two periods was that the proportion of middling investors holding more than £500 but less than £1,000 increased from 5.8 per cent in 1785 to 12.3 per cent in 1805, and the value of their holdings rose from 12.9 per cent to 23.9 per cent of the whole.

The relative importance of the urban savers can be judged from the

³¹ S.R.O. D/T/ba, Min. Bk. 6, 26 June, 27 July, and 17 Aug. 1759, 6 March and 10 April 1761.

³² S.R.O. D/T/ba, Min. Bk. 6, 20 Feb. 1761; Min. Bk. 9, 7 June 1806.

³³ In the *Turnpike Road System*, p. 113, Albert concluded that "the greatest proportion of capital invested came from the landed classes—farmers, gentry and landowners", a view repeated in 'The Turnpike Roads', p. 54. But the growing importance of other social groups was noted in both studies, though with the acknowledgment in the former that "To discover the occupations of many trusts' investors would require very detailed local research", p. 101 n. 71, repeated in the latter, p. 53. This problem has been tackled for the Bath Trust by reference to a wide range of sources, e.g. leases of Bath Corporation and local directories.

Table 2. *Capital Raised on the Mortgage Deeds of the Bath Turnpike Trust, 1758-1833: An Analysis of Investors*

Year	Capital raised £	1 Peers £	2 Gentry £	3 Farmers £	4 Capitalists £	5 Manufacturers £	6 Tradesmen £	7 Professionals £	8 Clergy £	9 Women £	10 Institutions £
1758-9	12,000		200		5,300		1,000	5,000		500	
1762	800		500		300						
1772	500		250		50			200			
1773	4,500		250	500	500		100		750	2,400	
1779	2,300		600	250		500				950	
1790	200							200			
1791-5	1,800							1,400		100	
1796-1800											
1801-5	1,300		200		400	100	100	200	100		100
1806-10	4,350		100		700		600	1,500	450	1,000	
1811-5	2,150		200	150	900	250	450		50	50	100
1816-20	2,300				700					500	100
1821-5	5,850				1,300		900	500		100	
1826-30	6,500				2,500		1,000			2,000	
1831-3	17,700				300					2,100	

Sources: See Table 1

Notes:

1 See the text for an explanation of the method of classification. In later years some investment remains unclassified, due to lack of evidence.

2 After 1790 the years have been grouped, since capital could then no longer be raised as required. Easier conditions began to return in the 1820s, and in 1830 an advertisement for £6,000 at 4% produced offers totalling £21,000 (S.R.O. D/T/ba, Min. Bk. 12, 3 July 1830).

Table 3. *The Secondary Market in the Mortgage Deeds of the Bath Turnpike Trust, 1759-1835: An Analysis of Purchasers*

<i>Year</i>	<i>Securities sold £</i>	<i>1 Peers £</i>	<i>2 Gentry £</i>	<i>3 Farmers £</i>	<i>4 Capitalists £</i>	<i>5 Manufacturers £</i>	<i>6 Tradesmen £</i>	<i>7 Professionals £</i>	<i>8 Clergy £</i>	<i>9 Women £</i>	<i>10 Institutions £</i>
1759-60	1,250		50				150	1,000			50
1761-5	7,750		2,000	100	1,000		2,000	1,700		950	
1766-70	2,300									2,300	
1771-5	3,150		500		1,000		900	100	150	500	
1776-80	7,900		600	850	500	400	2,000	500	850	2,200	
1781-5	5,650		700	650	450		1,600	1,000	500	750	
1786-90	2,650		1,000		200	700	50	200		500	
1791-5	4,200				1,300		900	1,550		450	
1796-1800	5,450			200	1,500		2,850			900	
1801-5	3,400		200	150	1,350		100	400	400	700	100
1806-10	2,400			250	1,450		450	50	100	100	
1811-5	1,750			350	1,000	100	100			50	150
1816-20	1,400			200		50	300	300		550	
1821-5	1,500							1,100		400	
1826-30	700				300					400	
1831-5	2,000						1,000		1,000		

Sources: See Table 1

Table 4. *The Long-term Capital of the Bath Turnpike Trust: An Analysis of Creditors in the Years 1785 and 1805*

<i>Year</i>	<i>Mortgage debt £</i>	<i>1 Peers £</i>	<i>2 Gentry £</i>	<i>3 Farmers £</i>	<i>4 Capitalists £</i>	<i>5 Manufacturers £</i>	<i>6 Tradesmen £</i>	<i>7 Professionals £</i>	<i>8 Clergy £</i>	<i>9 Women £</i>	<i>10 Institutions £</i>
1785	Value of deeds held: £17,000		2,700 15.9%	1,950 11.5%	4,300 25.3%		3,000 17.6%	950 5.6%	400 2.3%	3,700 21.8%	
	Number of creditors: 52		5	10	6		6	2	3	20	
1805	Value of deeds held: £20,700 including £500 with unspecified creditors		800 3.9%	550 2.7%	6,750 32.6%		5,450 26.3%	1,250 6.0%	600 2.9%	4,500 21.7%	300 1.5%
	Number of specified creditors: 56		5	5	12		7	4	3	17	3

Sources: See Table 1. In particular S.R.O. B/T/ba 41, Lists of creditors for 1785 and 1805

accompanying tables, of which Table 2 deals with the primary capital market, Table 3 shows activity in the secondary market, and Table 4 provides cross-sections for particular years, summarizing the results of participation in both markets. The system of classification is essentially that devised by J. R. Ward in his work on the financing of canals, though with certain modifications to meet the present case.³⁴ The most important relates to the changing status of investors, for the present analysis deals with investment over time, whilst Ward's concern was with the original shareholders only. This problem has been met by incorporating changes of status so that, for example, a maltster or wine merchant has been shifted from the category of manufacturer or tradesman to that of capitalist at the point when his designation as esquire by contemporaries indicated a change in the scale of operations and an accumulation of private assets, although the earlier business may have remained the source of income. The classifications used by R. S. Neale in his study of Bath have not been adopted despite their possible advantage for comparative purposes, because his system of four groups (leisured and professional men; building trades; service trades; and others), within each of which investors are listed separately, is too unwieldy for an analysis spanning 80 years. Neale himself uses these categories only rarely, and then usually to analyse a specific project in a particular year.³⁵

The first three columns in each table comprise the landed interest whose generally low level of investment, already noted, is all the more surprising in view of the extension of Ward's categories to include here substantial country clothiers and mining proprietors with the landed gentry (col. 2), and rural tradesman such as blacksmiths and victuallers with the farmers (col. 3), for all these may be considered to have had an economic interest in the roads. The remaining categories (cols. 4 to 10) comprise the urban interest, mostly resident in Bath but with a few Bristol and London addresses. These included capitalists or urban gentlemen (col. 4) whose ranks were increased, as time passed, by the infusion of successful merchants and professional men; tradesmen (col. 6), including upholsterers and saddlers as well as Ward's grocers, ironmongers, and lesser merchants; and professional men (col. 7), including architects and musicians as well as Ward's attorneys, surgeons, and apothecaries. The low level of involvement by manufacturers (col. 5) with other uses for their funds is not surprising. However, they and clergymen (col. 8) were briefly important in the 1770s and again after the turn of the century, from which time, too, there were occasional contributions from smaller tradesmen such as butchers and coal merchants, and from artisans investing individually or through friendly societies (col. 10). Special mention must be made of women (col. 9), particularly as their role has elsewhere been described as "marginal".³⁶ They covered a wide social and economic range (including gentlewomen, widows and daughters of professional and trades men, lodging-house keepers pursuing a vigorous economic life of their own, and occasionally servants), and they were important in volume of subscriptions as well as in numbers. They were especially important in the 1770s when they provided 46 per cent of the capital then raised.

³⁴ J. R. Ward, *The Finance of Canal Building in Eighteenth-century England* (Oxford, 1974), pp. 18-26.

³⁵ R. S. Neale, *Bath, 1680-1850: A Social History* (1981), pp. 153-4, 298-9.

³⁶ Albert, *Turnpike Road System*, p. 107.

Some of these investors may, of course, have had an indirect economic interest, but the structure of investment here described, with its emphasis on the small urban saver, suggests that the chief concern was not the state of the roads but a good return on a secure marketable investment. The claim of a financial motive at this early date calls for a fuller review of the regional capital market, both to explain how it functioned for the purpose of disinterested investment, and to elucidate those features which made for delay in the realization of the Trust's financial powers. The work of the attorneys was of prime importance in these matters. Their expertise in the development of the institutional mortgage was of great consequence, but of even more significance in the present argument was the shift in their role from its former emphasis on matching the financial needs of known clients in a personal capital market, to that of soliciting funds from unknown clients (through notices on turnpike gates and later by advertisements in newspapers) for investment in public utilities with which the savers had no direct economic concern.³⁷ This development was doubly important: to the turnpike trust, because although their capital requirements were considerable they had no recognized place in the structure of credit which supported other concerns such as manufacturing ventures; and to the urban savers because of the investment outlet thus created.

This facility did not, however, exist, in isolation but as part of a general pattern of institutional borrowing in the area. By the mid-eighteenth century borrowing at interest by the Corporation of the city of Bath was already well established on the security of bonds given under the Common Seal, and in the 20 years from 1757, during which the Trust raised £17,000, the Council borrowed a very similar sum.³⁸ Then between 1778 and 1786 a total of £10,700 was raised by the Corporation, largely on a new form of bond made out in units of £100 instead of simply reflecting the sum offered.³⁹ In contrast, there was little Corporation borrowing in the later 1780s, probably because of the activities of the newly formed Bath Improvement Commissioners, who raised £25,000 in the years 1789-91.⁴⁰ A classification of the investors in this urban renewal scheme on the basis described earlier shows that 9.2 per cent of the capital subscribed came from the landed interest, 50.2 per cent came from the urban gentry and substantial merchants, 6.0 per cent from tradesmen,

³⁷ The role of the attorney as "an intermediary for inter-personal lending" has been explored by B. L. Anderson, 'The Attorney and the Early Capital Market in Lancashire', in Francois Crouzet, ed. *Capital Formation in the Industrial Revolution* (1972), p. 229, and their importance as "go-betweens in directing money" into transport and public utility schemes has been briefly touched upon by M. Miles, 'The Money Market in the early Industrial Revolution: the Evidence from West Riding Attorneys, c. 1750-1800', *Business History*, 23 (1981), p. 140. But the development of function by which attorneys came to operate the impersonal capital market here described, has so far been neglected.

³⁸ B.G.A. Minute Books of Bath Corporation and the Book of Account of the several Sums of Money borrowed by the Corporation of Bath, 1765-1803. See also Neale, *Bath*, app. A, pp. 384-90, and Sylvia McIntyre, 'Towns as Health and Pleasure Resorts: Bath, Scarborough and Weymouth, 1700-1815' (unpublished D.Phil. thesis, University of Oxford, 1973), pp. 443-6. Both calculate the cumulative debt of Bath Corporation from the Chamberlains' Accounts, but by 1800 Neale records a total of £57,500 against McIntyre's £32,600. See also McIntyre, 'Bath: The Rise of a Resort Town, 1600-1800' in Peter Clark, ed. *Country Towns in Pre-industrial England* (Leicester, 1981), pp. 226-7.

³⁹ B.G.A. Minute Books of Bath Corporation and the Account Book of the several Bonds made out in the nature of East India Bonds to the several Persons as within . . . , 1778-1803.

⁴⁰ B.G.A. Order Books of the Improvement Commissioners and The Bond Book of the Improvement Commissioners, 1789-1823.

13.2 per cent from the professions, and 21.4 per cent from women. Manufacturers and clergymen made no contribution. The rural interest thus played an even smaller part than in funding the roads, but the urban capitalists were more important. Meanwhile, and much more slowly, the Bath Trust had increased its total capital raised from the £17,000 already mentioned for the 1770s to £20,300 by 1791, at a pace which suggests that its funding dovetailed with, and was delayed by, the activities of the other two institutional borrowers. To the saver this network not only gave the advantage of alternative opportunities, it also encouraged a familiarity with such mechanics of the market as the mortgage deed and rate of interest, through both of which devices investors were able to demonstrate their lack of an economic motive.

The mortgage deeds of the Bath Trust were attractive financial instruments because they were relatively risk free, available in small units of £50 (though with some larger ones of £100, especially from the turn of the century) and capable of holding their nominal value. They could be sold with ease when investors needed to realize their assets. The highest proportion of turnover in the secondary market to which this practice gave rise was between 1761 and 1765 (see Table 3) when deeds to the value of £7,750 changed hands out of a mortgage debt of £12,000. Sales were even higher between 1776 and 1780, with a value of £7,900, but the mortgage debt was then £17,000. The vigour of these sales suggests that in other five year periods it may have been not so much a shortage of funds which limited this secondary market as a shortage of deeds for sale. This situation may have arisen because the deeds were capable of performing different functions for different savers. Possibly one-fifth were held as long standing investments, devised by will or coming on the market only when sold by executors, for over 20 per cent of the £12,000 raised in the later 1750s was disposed of in this way, and the list of creditors for 1805 shows that a similar proportion of the capital sum was then held by executors. But most deeds circulated more rapidly, being held only for a short time before being re-sold, perhaps by a tradesman "having an occasion for the said £50", in the words of some endorsements. The period of greatest velocity was the decade from the early 1790s, when not only the deeds of the Trust but also the financial securities of the Bath Corporation and Improvement Commission changed hands with great rapidity, some deeds several times in the course of a year. The results of this activity may be seen in Table 5. The fact that the secondary market flourished thus at a time when there was some difficulty in raising capital for new works suggests that although the marketability of the deeds helped the Trust raise funds by generating confidence in its securities, this quality may also have worked to its disadvantage by deflecting into the secondary market some of the savings needed for improvements and construction work.

Negotiation of the terms on which investment capital could be secured also tended to cause delays. For example, after an initial offer of 3.5 per cent in 1757, the trustees were less than a year later obliged to settle on 4.0 per cent in order to raise £12,000. Between December 1760 and June 1764 the rate had to be raised to 4.5 per cent, and in the course of this period (in 1762) the trustees had to pay 5.0 per cent on a further £800 in order to start work on the new road to be built by Jacob Mogg already mentioned.⁴¹ Viewed in

⁴¹ S.R.O. D/T/ba, Min. Bk. 6, 21 July, 28 July, and 11 Oct. 1757, 28 Nov. 1760, 23 Oct. 1761, 2 April and 17 Dec. 1762, 13 April 1764.

Table 5: *The Secondary Market in Institutional Securities in Bath, 1789-1804*

Year	1 Bath Corporation £	2 Bath Turnpike Trust £	3 Bath Improvement Commission £	4 Total sums involved £
1789			100	100
1790		900		900
1791		800	500	1,300
1792		250	2,500	2,750
1793		500	2,700	3,200
1794	17,400		300	17,700
1795	1,000	2,650	1,100	4,750
1796	7,000	200	2,150	9,350
1797	4,150		100	4,250
1798	1,300	1,400	2,100	4,800
1799	900	2,850	400	4,150
1800	600	1,000	2,000	3,600
1801	2,700	1,850	400	4,950
1802	2,250	500		2,750
1803	900		500	1,400
1804		1,050	100	1,150

Sources: As for Table 1. In addition, B.G.A. Minute Books of Bath Corporation, 1757-1834; Book of Account of the several Sums of Money borrowed by the Corporation of Bath, 1765-1803; Account Book of the several Bonds made out in the nature of East India Bonds, 1778-1803; Order Books of the Bath Improvement Commissioners, 1789-1832 and Bond Book of the Improvement Commissioners, 1789-1823.

Notes: The table covers the years from the first sale of a deed of the Bath Improvement Commission to the last available evidence on the deeds of the Bath Corporation. The secondary market in the latter did not necessarily cease at this point, for after a similar absence of evidence a decade earlier the registration of transactions totalling the unusually high sum of £17,400 in 1794, suggests that this was probably a retrospective figure covering sales from the preceding years.

isolation these and subsequent negotiations may suggest caprice on the part of the investors, but when studied in context they can be seen to reflect the general financial conditions of the time and are therefore further evidence that savers were influenced by these, rather than economic, motives. Thus the offer of 3.5 per cent in 1757 represented not only the going local rate (for Bath Corporation had just negotiated a loan of £600 at that price), but also the return on long-term London securities as shown by yields on Bank stock and the Funds.⁴² The rate in both the London and provincial markets then fluctuated upwards in a trend associated with the Seven Years War (1756-63), with Bank stock approaching a yield of 5.0 per cent in 1762. It is therefore not surprising that potential investors held back until the Bath Trust also offered higher rates to secure and retain the capital it needed. The Trust rate was reduced to 4.0 per cent from June 1764 until December 1778, when an increase to 4.5 per cent was associated with the need to raise £2,300.⁴³ From the mid-1760s the London rate also fell, rising again during the War of

⁴² B.G.A. Bath Corporation Min. Bk. 7, 27 June 1757. Information on Bank of England stock and government securities is from L. S. Pressnell, 'The Rate of Interest in the Eighteenth Century', in L. S. Pressnell, ed. *Studies in the Industrial Revolution* (1960), pp. 178-214. See also Albert, *Turnpike Road System*, pp. 120-31.

⁴³ S.R.O. D/T/ba, Min. Bk. 8, 5 Sept. 1778 and 2 Jan. 1779.

American Independence (1776-83), especially in the years from 1778 when it reached 4.5 per cent and then fluctuated around 5.0 per cent. From the mid-1780s to the mid-1790s it fell again, reaching almost record low levels in 1792. From 1788 the minutes of the Bath Trust record their efforts similarly to lower the rate. They achieved this briefly in 1792/3 with a reduction to 4.0 per cent, as did the Corporation and Improvement Commissioners also, but they were then thwarted by their creditors who threatened withdrawal unless the rate returned to 4.5 per cent. The trustees had to agree and the rate remained at 4.5 per cent until December 1796 when they sought £1,300 for a new road, whereupon it was raised to the legal limit of 5.0 per cent. The rates of the Bath Corporation and the Improvement Commissioners were similarly raised to 5.0 per cent in 1796-7, and the London yield was also then rising, fluctuating around the 5.0 per cent level during the French and Napoleonic Wars. Not until the early 1820s were the three bodies in Bath able to reduce their respective rates to 4.5 per cent.⁴⁴

These observations on the closeness of movement between the returns on capital in London and Bath may provide some confirmation of the suggestion of T. S. Ashton, developed by Pressnell, that trends in the metropolis were indicative of financial conditions in the provinces. This is contrary to the general tenor of Albert's findings, although he does concede the development of a closer adjustment between trust rates and London conditions from about 1775, but his conclusions are based upon a heterogeneous collection of rates from many trusts, and a method which fails to provide the continuity necessary to show movements in the provincial rates themselves is unlikely to permit a satisfactory comparison with the metropolitan rates. The complementary suggestion by Ashton that these prevailing rates were significant for those contemplating investment, particularly in the public utilities, was examined by Albert and also found wanting.⁴⁵ On this matter the evidence from Bath is more equivocal, for although lower rates may have been associated with investment decisions, it was often necessary for trustees to increase their offer before capital could be raised and new work begun.

The similarity of movement with the London rate may suggest that Bath was metropolitan rather than provincial in character, so that however representative its structure and administration, the Trust cannot stand proxy for these bodies in general. But several arguments can be advanced to show that contrary to this implication, Bath was not a special case. First, the circumstances of its building as a fashionable spa have long made the city a focus for special attention, but the growing volume of research on urban history is now changing the perspective within which all towns are viewed, allowing Bath to be seen as only one centre amongst many which were undergoing such changes. P. J. Corfield has summed up this new understanding by writing that Bath "was by no means a solitary case. Indeed, rather the contrary: the extent of fashionable townscaping, smart housing, and dextrous refronting of older buildings was apparent in many towns."⁴⁶

⁴⁴ S.R.O. D/T/ba, Min. Bk. 8, 2 Aug. 1788 and 3 March 1792; Min. Bk. 9, 6 July 1793 and 7 Jan. 1797; Min. Bk. 11, 6 Sept. 1823. B.G.A. Bath Corporation Min. Bk. 11, 20 April 1792; Min. Bk. 12, 20 March 1797; Min. Bk. 14, 11 Nov. 1822. Order Book of the Improvement Commissioners, 15 June 1792, 26 July 1797, 31 Aug. 1822.

⁴⁵ Albert, *Turnpike Road System*, pp. 120-31.

⁴⁶ P. J. Corfield, *The Impact of English Towns, 1700-1800* (1982), p. 175.

Second, the funding of the turnpike trust was in any case almost completely detached from the financing of the speculative and building activities in the city. The fact that only some 7.5 per cent of those financing the Trust can be found in the pages of R. S. Neale's recent study of Bath, and then sometimes only in lists of councillors granting permission for building works, provides useful support for the view that the funding of this undertaking was distinct from the more famous social and economic activities of the city.⁴⁷ Further evidence comes from differences of timing, for after the major investment in the later 1750s, fund raising by the Bath Trust did not coincide with the building booms identified by Neale, and described by him as being "embedded in the national money market".⁴⁸ Although some capital was raised in the two periods singled out by Neale, 1762 to 1771 and 1785 to 1792, borrowing by the Trust was heavier in the intervening years.⁴⁹ It is probably the neglect of this separate financial market which has led to an important omission in Neale's account of the transformation of Bath from Cotswold town to Palladian city. This change is analysed chiefly in terms of the entrepreneurial skills of the financiers and builders on the one hand, and the labour of the workers on the other, without giving due weight to the important role of the small saver in the provision of the infrastructure upon which the whole edifice depended.

Third, no evidence has been found of any institutional links between the Bath Trust and the metropolis for most of this time. The Trust made no use of the developing banking system until 1808 when Messrs Clement and Tugwell of Bath (both qualified trustees) became its treasurers.⁵⁰ Before that its finances were handled by local businessmen, such as a linen draper.⁵¹ Nor has any overlap been found between metropolitan and provincial savers, for the Bath investors were largely local residents rather than temporary visitors. A causal connexion between movements in the returns on capital therefore seems unlikely. Instead, it may be the case that these financial markets were similarly but independently influenced by the comparable motives of investors, for it can be argued that the disinterested provincial savers were close in attitude if not in scale of investment to the merchants, professionals, tradesmen, and women of London who were the most important individual domestic investors in government and related stock.⁵² The conclusion, there-

⁴⁷ An example of the separation of these markets is provided by Lewis Clutterbuck, attorney, and town clerk of Bath 1757-76, who loaned speculative funds to the architect John Wood the younger (Neale, *Bath*, p. 161), after divesting himself of his substantial investment in the Trust through 12 different transactions between 1759 and 1764.

⁴⁸ Neale, *Bath*, p. 168.

⁴⁹ Ibid. pp. 167-8. But figures in apps. A and B, pp. 384-97, raise questions about timing. For example, whilst the number of "Total houses" built in the boom years between 1765 and 1771 increased by only 12.7%, those between 1772 and 1780 (not accorded this epithet by Neale), can be seen to have increased by 27.8%. Building in those years also included the Hot Bath and Guildhall, both completed in 1778. I am grateful to Miss E. A. Holland and Mrs M. Oliver for their advice, based upon their *Survey of Old Bath*.

⁵⁰ L. S. Pressnell's observation in *Country Banking in the Industrial Revolution* (Oxford, 1956), pp. 265-6, that little was known of the financial aspects of local undertakings from original sources is still largely true. But supposition is an unsatisfactory remedy, and Pressnell's reasoning, based on the payment of turnpike trust 'dividends' by a London West End bank in the 1770s, that where they existed local banks "would surely have been used for this purpose" is not borne out by the Bath Trust, for which there is no available evidence to support the notion of an informal link before the formal association.

⁵¹ The annual balance in the treasurer's hands was £410 in the mid-eighteenth century, £1,147 towards the end of it. S.R.O. D/T/ba, Min. Bk. 6, 23 Aug. 1757; Min. Bk. 9, 7 Sept. 1793.

fore, is not that Bath was metropolitan and its turnpike trust consequently unrepresentative, but that the disinterested investors in both London and the provinces may have behaved in a similar fashion.

Finally, reference must be made to the annual income from the tolls as an influence on the pace at which capital was raised, since the more that the trustees could finance capital expenditure from the current revenue, the less susceptible were they likely to be to delays in the financial market. This capacity was not so much a function of the growing income from the tolls (Table 1, col. 4) as of the decreasing proportion of this revenue which was spent on repairs and other costs, and of the increasing surplus which was therefore available for capital works. Evidence that the growth in the tolls really could increase the net resources of the Trust comes from the fact that although over this period administrative costs and interest payments continued to absorb about 20 per cent of the current revenue, the cost of repairs as a proportion of income fell from about 78 per cent in the 1770s to 70 per cent in the early 1790s, and 50 per cent to 55 per cent in the later 1820s.⁵³ But this trend did not provide the trustees with a smoothly growing control over the timing of investment, first because the financial constraints of the French and Napoleonic Wars (1793-1815) severely limited the additional funds available in the capital market, and secondly because the expensive practices of the Trust's first professional surveyor, appointed in 1817, limited their management options. Benjamin Wingrove's strong commitment to sound construction in the Telford manner meant that much work of an improving nature was undertaken as a matter of routine, thus leaving little scope or finance for the trustees to exercise their executive powers. Disagreements on these matters led to Wingrove's resignation and the appointment of J. L. McAdam as general surveyor in 1826. As a result of this move the importance of the surplus revenue as a source of capital can be most fully demonstrated, for over the next three years a balance-in-hand of over £8,000 was built up to be invested in the major new works authorized in 1829.⁵⁴ On this base, and in the easier financial conditions of the early 1830s (see Table 1 cols. 2 & 3, and Table 2 n. 2), the trustees were able to undertake this construction without undue delay, by supplementing these reserves with funds raised in the local capital market. The borrowing powers granted earlier were thus eventually realized. The fact that by then all limits had been removed by the general Act of 1822 does not diminish the significance of the factors considered here, because for some 70 years they had influenced the time-lag between the authorization and implementation of the Trust's powers.

IV

It has now been demonstrated that the Bath Trust was not a static body but an evolving one, whose continuing development was shaped by legislation subsequent to that which established it. This conclusion is contrary to the

⁵² P. G. M. Dickson, *The Financial Revolution in England: A Study in the Development of Public Credit, 1688-1756* (1967), pp. 297-303.

⁵³ S.R.O. D/T/ba, Min. Bk. 8, Summary of Accounts 1770-6, 5 Nov. 1791; Q/R, Turnpike Trust General Statements of Account, 1822-50.

⁵⁴ S.R.O. D/T/ba, Min. Bk. 11, 22 July 1826; Q/R, Turnpike Trust General Statements of Account, 1822-50.

view implicit in recent macro-studies. The fact that in the case of the Bath Trust there was an approximately four-fold increase in both mileage and long-term capital stock suggests the need for a re-assessment of the whole matter of turnpike development by concentrating on the evolution of individual trusts within a network which was itself expanding. This would not only amplify our understanding of the overall contribution of the turnpike roads to the national economy in matters of construction, capital formation and finance, it would also open up for investigation previously unstudied aspects of the public utilities, especially the primary and secondary capital markets in which they operated, and the early practice of disinterested investment by provincial savers which they allowed.

The significance of this research goes beyond the immediate question of the turnpike trusts and their financing, however, for it also draws attention to the more general problem of the manner in which macro-studies are pursued, especially when they are based upon the unhistoric assumption that the component parts of an expanding system were not themselves also subject to change. By doing so this study illustrates the way in which the advent of the new economic history has signalled a change, not only in the method and form of macro-studies, but also in the function of research at the micro-level. The case study is no longer of only minor importance, either in its own right or as a contribution to the understanding of some general theme. It has now acquired significance as a corrective to the distortions and over-simplifications which may arise from the formation of national assessments on the basis of inadequate historical evidence. It is thus the current practice of macro-history itself which gives a new importance to the lessons to be learnt from the case study, and so rescues this approach from the tendentious charge of antiquarianism.

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**THE MANUFACTURE OF GUNPOWDER : A STUDY OF THE
DOCUMENTARY AND PHYSICAL EVIDENCE RELATING TO
THE WOOLLEY POWDER WORKS NEAR BATH**

BY

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The Manufacture of Gunpowder: a Study of the Documentary and Physical Evidence Relating to the Woolley Powder Works near Bath

B. J. Buchanan and M. T. Tucker

Summary: The manufacture of gunpowder is perhaps one of the most under-rated aspects of the changes associated with the classical years of the British industrial revolution. With its roots in Chinese learning and its associations with alchemy and the search for longevity, this commodity was nevertheless of immense practical significance in the development of both mining and trade, especially the triangular trans-Atlantic trade which brought into Britain such important raw materials as sugar, tobacco and cotton. This article pursues the limited aim of exploring one powder manufacturing site in the light of the documentary and physical evidence relating to it, but it is hoped that this may prove the starting point of a more comprehensive study of this neglected subject.

The Woolley powder works were built in the 1720s in the deep valley of the Lam Brook, 3 miles north of the city of Bath and $\frac{1}{4}$ mile from the small village of Woolley (ST 749688). They were one of several such mills in the countryside of the northern part of the former county of Somerset¹ where wooded valleys provided water power, charcoal, and the isolation which was so desirable in the manufacture of a hazardous product such as gunpowder. Despite the rural seclusion however, these sites were only relatively remote, for the early development of road and river transport in this region had made the trading centre of Bristol fairly easily accessible to its hinterland from the early decades of the eighteenth century. Into this port came saltpetre and sulphur, raw materials vital to the manufacture of gunpowder, whilst from it the finished product was shipped both coast-wise and abroad. As well as supplying these practical facilities the merchant community of Bristol provided the credit network upon which such trade depended, and helped to meet the capital requirements of the manufacturing concerns.

The production of gunpowder at the Woolley mills came to an end in the early years of the nineteenth century, and since then the site has been much changed. Some buildings have been lost through the processes of natural decay or demolition, and others have survived only by a continuing and confusing adaptation for agricultural and domestic use. Three rollers *ex situ* provide the only evidence of the plant which was once used, although the survival of two mill ponds and the remains of a network of watercourses suggest a once extensive use of water power. These fragmentary physical remains can support only a very speculative interpretation. However, this situation is redeemed by an unusual wealth of documentary evidence which provides information of a remarkable continuity from the 1740s to the early years of the nineteenth century and thus allows a more informed consideration of the manufacture of gunpowder at this site.

The survival of these papers was due entirely to the interest of the Stracheys, a gentry family who had lived since the 1630s at Sutton Court manor house some 10 miles south of Bristol.² Their association with the Woolley works followed upon a marriage into the family of John Parkin, a merchant of Bristol and an original partner in the firm. Filed away by the Stracheys were copies of early leases and partnership agreements from the 1720s; almost all the annual balance sheets from the 1740s to the turn of the century; and bundles of correspondence dealing with particular subjects such as the attempts to produce a powder which would meet the government's exacting requirements.³ These documents have already been used as part of a study of the financing of economic developments in the region,⁴ and in an attempt to relate the specific evidence from Woolley to general develop-

ments in the technology of powder making.⁵ It is now intended to put them to yet another purpose, that of helping to interpret the site to which they relate.

The challenge of this task is two-fold. First, the documents are chiefly concerned with the business and financial aspects of the undertaking, so that even information on the technological processes is only incidental, whilst that on the layout at Woolley is of an inferential nature. Second, there are the problems inherent in the site itself. The task of interpretation would be easier if it could be assumed that the disposition of the buildings had followed a pattern which was appropriate to powder making in general, but this was not the case. Restored powder works such as those at Frederiksværk in Denmark established in 1756 by royal decree, or those in the Brandywine valley of Delaware founded in 1802 by the Du Pont family, impress by their linear layout along a river valley in an arrangement which allowed for a recurring use of the available water power. This pattern had also been adopted at powder works which were historically and geographically closer to Woolley, as may be seen from a contemporary survey sketch of the early eighteenth century Chilworth mills in Surrey.⁶ At Woolley however, there is sufficient evidence to suggest that, even when allowances are made for the inevitable decay, disappearance, and adaptation of the original structures, the layout was essentially that of a scatter of buildings rather than a linear development. This means that the arrangements at Woolley must be explained in terms of the problems and opportunities internal to the site, rather than by comparison with other undertakings.

It is proposed to explore these problems under three heads. First, there will be a brief account of the processes involved in powder making so that some estimate may be formed of the buildings and plant which had to be accommodated at Woolley. Second, there will be a description of the site, its past and present structures, their possible function in earlier times, and the factors peculiar to this location which may have influenced these arrangements. Third, there will be an attempt to assess the wider significance of the Woolley powder works in terms of the international trading network within which they functioned, of the relationship between Bristol and its hinterland, where they were only one of several manufacturing concerns associated with the port and its merchants, and of the changing chronological and geographical pattern of powder making in England within which they had an

important role. The site at Woolley is of great interest, and it is likely that much would be revealed by excavation, but with the present paucity of physical evidence and the consequent uncertainties of interpretation, it is the context within which the powder works operated, as revealed by the documentary evidence, which justifies this concentration of attention upon one enterprise.

Gunpowder Manufacture

Gunpowder is essentially a simple mixture of charcoal, saltpetre and sulphur, in varying proportions.⁷ A memorandum of 1747/9 shows that at Woolley the 'best powder' was then held to be that composed of 64 or 70 lb of saltpetre, 18 lb of sulphur and 18 lb of charcoal.⁸ Of these three ingredients the charcoal presented least problems, for as the annual balance sheets reveal this was purchased locally and already charred,⁹ so that no special provision had to be made for its preparation other than crushing. However, as the charcoal stocks at the mid-year casting up could amount to 1,500 to 2,000 bushels, some buildings were probably required for storage.

In contrast, both the saltpetre and sulphur came from abroad,¹⁰ and before use both underwent preparation at Woolley, with a consequent need for special buildings and plant. The evidence for this claim comes largely from the annual inventories of raw materials, for these frequently recorded separately the amount and value of rough petre and refined petre, rough brimstone and refined brimstone, showing that at the stock taking there were at the mill some ingredients which had not yet been refined and some which had.¹¹ Although details of the raw materials on board ship were remarkably fully itemised in the case of saltpetre, perhaps because these cargoes were handled by the Bristol merchants rather than those in London who organized the shipment of sulphur, it was not until 1788 that any was described as being already refined. Furthermore, correspondence in the early 1760s between the proprietors and the Board of Ordnance confirms that these preparations were indeed commonly undertaken at Woolley, for the Board paid particular attention to the refining of ingredients at the works, as an area providing scope for improvement.¹²

The prepared ingredients were then mixed or incorporated under edge runners, with the addition of water to minimize the risk of an explosion. This was the most dangerous of the processes and may have been responsible for the loss of two lives recorded in the Swainswick parish register in 1724

and a third in 1734.¹³ It may be presumed that safety precautions or expertise were improved, for no other such incidents are recorded.

The memorandum of 1747/9 records that at Woolley there were four mills, each capable of grinding 25 lb in 2 hours. The water was 'worked twice over'. In the 1760s the quality of the edge runner stones came under close scrutiny, for the proprietors were concerned at their continuing failure to meet the government's standards. They thought this may be due to '... a defect in the weight of our Runners as they are not heavier than from 50 C [hundredweight] to 3 Tons & those of the Powder Makers in London are from 5 to 6 Tons weight'.¹⁴ However, in the correspondence already referred to, Sir Charles Frederick of the Board of Ordnance advised that the problem was more likely to be a want of smoothness in both runners and bed than a lack of weight, for the runners at Faversham did not much exceed 2 tons. But they had been '... turned Smooth (in a kind of Turning loom) ... by Two Men who were sent thither by the makers of the Runners', and this course was recommended to the Woolley partners.

The product of this incorporation under pressure was termed serpentine powder. It was the simplest form of gunpowder which could be made, but it suffered the disadvantage of separating out into its distinctive ingredients when transported in barrels. Three further stages were therefore added to the process, each designed to minimize this separation by increasing the consolidation of the grains.¹⁵ There is evidence that each of these three improvements was practised at Woolley, with a consequent need for appropriate equipment.

First, there was the technique of corning, the earliest reference to which was in 1440 in Germany. The wet incorporated powder was forced through a sieve, thereby making pellets resembling grains of corn, hence the name. There is evidence from the inventories that at Woolley the corning process had evolved to the stage where not merely discrete grains of powder, but grains of a specified uniform size could be produced. Thus, from the 1740s onwards, stocks of gunpowder were listed as F, FF, or FFF, in increasing order not only of fineness of grain but also value, for the smaller the grain the easier it was to ignite and the more rapidly the powder burnt. A typical example, that for 1749, reads:

By 3 barr^{ls} & $\frac{1}{2}$ FFF Gunpdr at 73/- 12.15.6
 By 95 barr^{ls} FF Do at 68/- 323.00.0
 By 96 barr^{ls} & $\frac{1}{2}$ F Do at 63/- 303.19.6

In the 1789 balance sheet the item '111 Barrels F & FF Corn'd and in dust 55/-', provides the only reference by name to a process which the circumstantial evidence shows to have been long established.

The second improvement came with the introduction of glazing in the 1680s. Before the corned powder was dried it was tumbled in the rotating wooden drums of a glazing mill, the grains being thus rounded off, compacted and polished. The resulting dust was usually removed by screening, although the occasional references in the Woolley papers to powder 'in dust', as in the above item for 1789, raises doubts as to whether this was always done. This wording may however imply only that the powder awaited screening.

The last development to be introduced into this sequence of processes came when the incorporated powder was pressed before being corned, in order to raise the specific gravity and increase the explosive power. This was introduced into the industry from the 1780s, at first with the small boxes and hand operated screws which were in general use until the mid-nineteenth century, later with hydraulic presses. The Woolley papers contain no specific reference to this process.

Finally came the drying of the powder, for even after all these processes it still retained some of the water added during incorporation. This would not at first have called for special buildings, the powder being simply dried in the sun on long tables. Later however special dry houses were built and the powder was set out on trays over which hot air circulated, heated for safety by an external stove. This method continued to be the general practice until the 1870s (after which the powder was dried whilst being glazed in large barrels) and its use at Woolley is suggested by the 1747/9 memorandum which states that 'The Stove dries from 70 to 80 Barrels at a time and that in 48 hours', each barrel representing 100 lb of powder. However, the 1795 inventory records 'Powder in Stove and Glazg Mill, 70 Bars @ 75/-', thus giving only one valuation for the powder being dried and glazed. It is tempting to speculate on the technological innovation thus implied, but the joint valuation probably reflects only administrative convenience.

To sum up, the manufacture of gunpowder at Woolley involved the preparation of the raw materials, their incorporation in water powered edge runner mills, the pressing of the resulting mill cake, and its corning into discrete grains which were then glazed, dried and packed in barrels. This description of the stages of manufacture cannot

establish beyond doubt the range of buildings and equipment which would have been found on the site in its productive years, but it can suggest the structures that may reasonably be assumed to have been there during that time.

The Woolley Site

Consideration must now be given to the physical appearance of the site on which these historical features were once established. As Figure 1 shows,¹⁶ the most obvious remains of Woolley's earlier manufacturing history are the two millponds, each with its attendant group of buildings. It seems probable that the lower site near the brook was the long-established location of the corn mills at Woolley, two of which are recorded in Domesday Book, whilst the manufacture of gunpowder was probably undertaken chiefly on the upper ground.

Some confirmation of this supposition may be derived from the terms of the lease of the Woolley site in 1729.¹⁷ This indenture, which was a renewal of a first lease of 1722, distinguishes between the existing mill and mill house, and the new powder mills served by a '... Cutt lately made at Woolley aforesaid and running down to the new Powder Mills there lately erected ...'. The new cut was presumably the formerly substantial leat which ran for about $\frac{3}{4}$ mile from a dam on a principal branch of the Lam Brook at Lower Langridge (ST 743695). Its silted-up and grassed-over course can be traced along the 200 ft contour to the massively-embanked upper mill pond at Woolley, located on the steep hillside some 50 ft above the brook. The importance of this leat for the powder making site was emphasized by a further clause in the 1729 lease which allowed for a rebate to the lessees should they

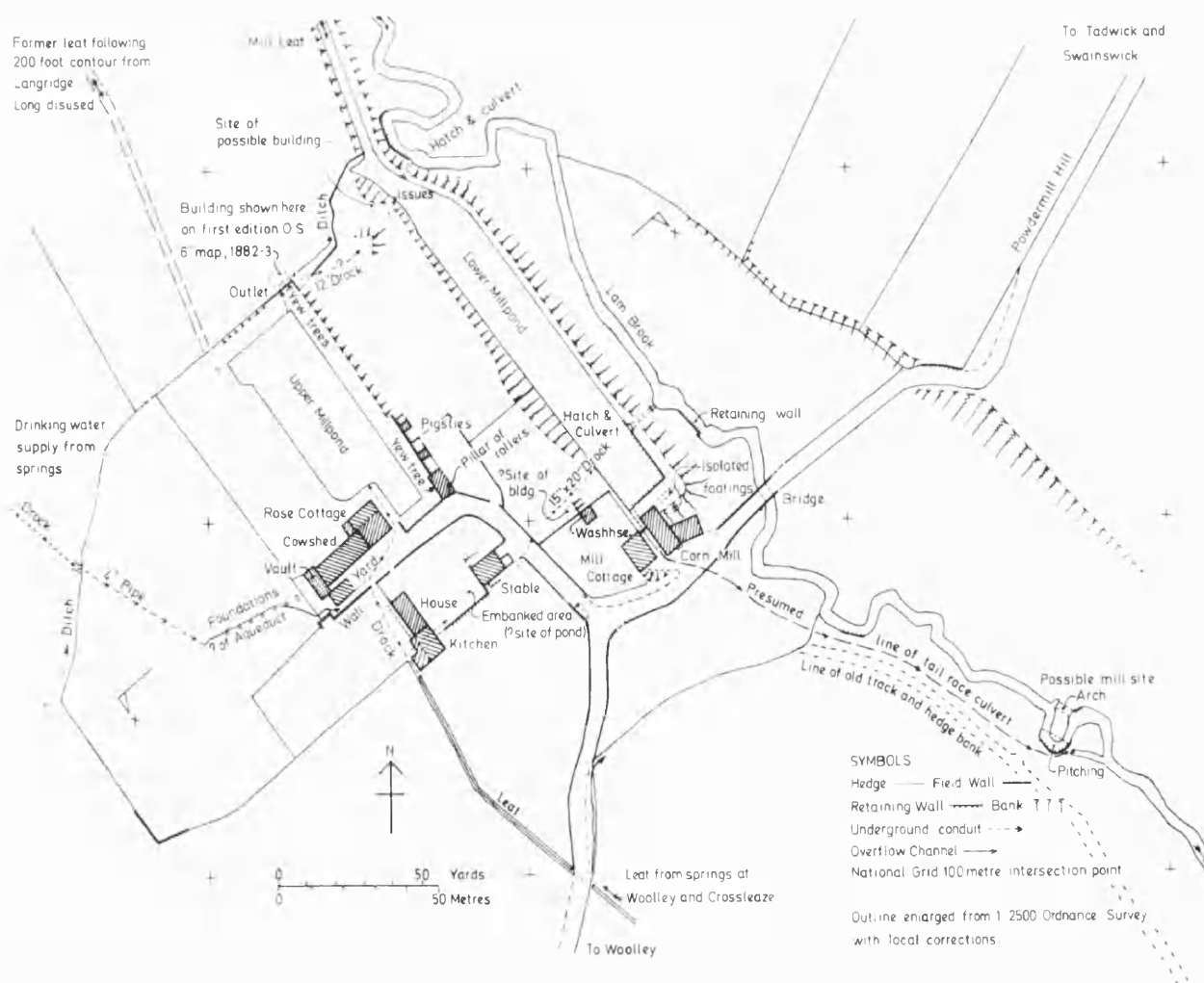


Fig. 1 Mill Farm, Woolley, Bath: site of gunpowder mills. Plan of site with buildings standing c. 1930.

ever '... be obliged to Turn the Water again from the above mentioned New Cutt into the Neighbouring Brook from whence it hath been Diverted'.

It is presumed that the lower pond was already in existence for the corn mill before the establishment of the powder mills. It was served by a 150 yd leat, now dry, from a dam on the Lam Brook (ST 749690). The lower site would have benefited from the extra storage capacity of the upper pond, which discharged into the lower one. Whether corn milling was continued during the operation of the powder mills in the eighteenth century is not known.

The pre-emption by the corn mill of the more conventional lower ground explains in part the location of the new works some distance above the brook. An incidental benefit would be isolation from floods, for in common with other streams in the Bristol Avon catchment area the Lam Brook falls fairly steeply over a clay subsoil and run-off is relatively flashy, responding rapidly to rainfall. But dry weather conditions can be expected to have been the determining factor. In the dry periods of summer, the springs from the oolitic limestone capping the hills, maintain only a modest flow, of the order of 0.5 mgd below Woolley, whilst due to the geography of the site the water available for the upper mill pond would have been about half this estimate. This is one-tenth of the flows that can occur in wet weather and perhaps only one-sixtieth of peak flood flows.¹⁸ The main advantage offered by the upper location on this site where water supplies were limited and fluctuating would be the prospect of using water twice or more times over as it returned down the steep hillside from the upper to the lower pond and thence to the brook, though such a scheme would require substantial construction works.

It seems clear that steps were taken to improve the general supply by bringing to the powder mills nearly all the water available in the Manor of Woolley. In addition to the two leats already mentioned, a $\frac{1}{2}$ mile long leat was built from a small side stream south of Woolley (ST 748683) and into this were diverted springs still further down the valley (ST 753680) via a stone conduit. There was also a direct supply of pure spring water, to be referred to later. Even so, the mills had to shut down in midsummer through lack of water, an inconvenience of which Henry Strachey was reminded by the managing partner in 1801 when the latter observed that the annual stock taking took place in June because then '... our Mills usually stand still for want of Water'.¹⁹ If an industrial

venture was to aspire to a reasonable continuity of production on this relatively small stream therefore, it was essential that a system should be devised which was able to abstract the maximum potential energy from a limited volume of water, and it is likely that the upper site offered the best scope for such a layout.²⁰

Unfortunately the location of the buildings associated with the hydraulic works is largely a matter of speculation. Thomas Thorpe's map of 1742 shows what is probably only a diagrammatic scatter of buildings, and later maps are no more helpful.²¹ When powder making ceased in the early nineteenth century the site became, or reverted to, an agricultural holding worked in conjunction with the corn mill which continued to function as such until the mid-twentieth century. The paucity of substantial remains suggests that some buildings were dismantled, perhaps to provide stone for alternative uses such as field walls, or because they were considered unsafe. An unusual abundance of field walls, some containing pieces of dressed stone, may indicate the extent of demolitions. Other buildings underwent a change of use. Thus at the upper site the principal remains are now incorporated in the agricultural and domestic buildings of Mill Farm. Evidence for their earlier uses is tantalisingly inconclusive, being mostly in the form of blocked openings and discontinuities of masonry. Walls are of the oolitic limestone rubble typical of the southern Cotswold Hills, usually with dressed quoins. The farmhouse of three storeys plus basement is Georgian in proportion but its details and tall storey heights suggest a mid-nineteenth century construction. The single-storeyed kitchen wing is older, however, with a chimney of eighteenth century vernacular appearance extended upwards in nineteenth-century red brick. The Worgan family who had a continuing interest in the powder mills as managing partners lived at the site, perhaps in a predecessor of the present house.

The adjoining farm cottage, formerly Rose Cottage and now named The Decoy, achieved its present form in the late nineteenth century. At its rear it incorporates an older structure, originally one and a half storeys high, with a single-light stone window of cusped round-headed quasi-Gothic design and the remains of a second one, both set symmetrically beneath blocked-up rectangular panels of more classical derivation. This would seem to be eighteenth-century ornamental work, perhaps undertaken at the whim of Mrs Elizabeth Parkin, another of the proprietors and Lady of the Manor, for whom in 1761 Woolley church was

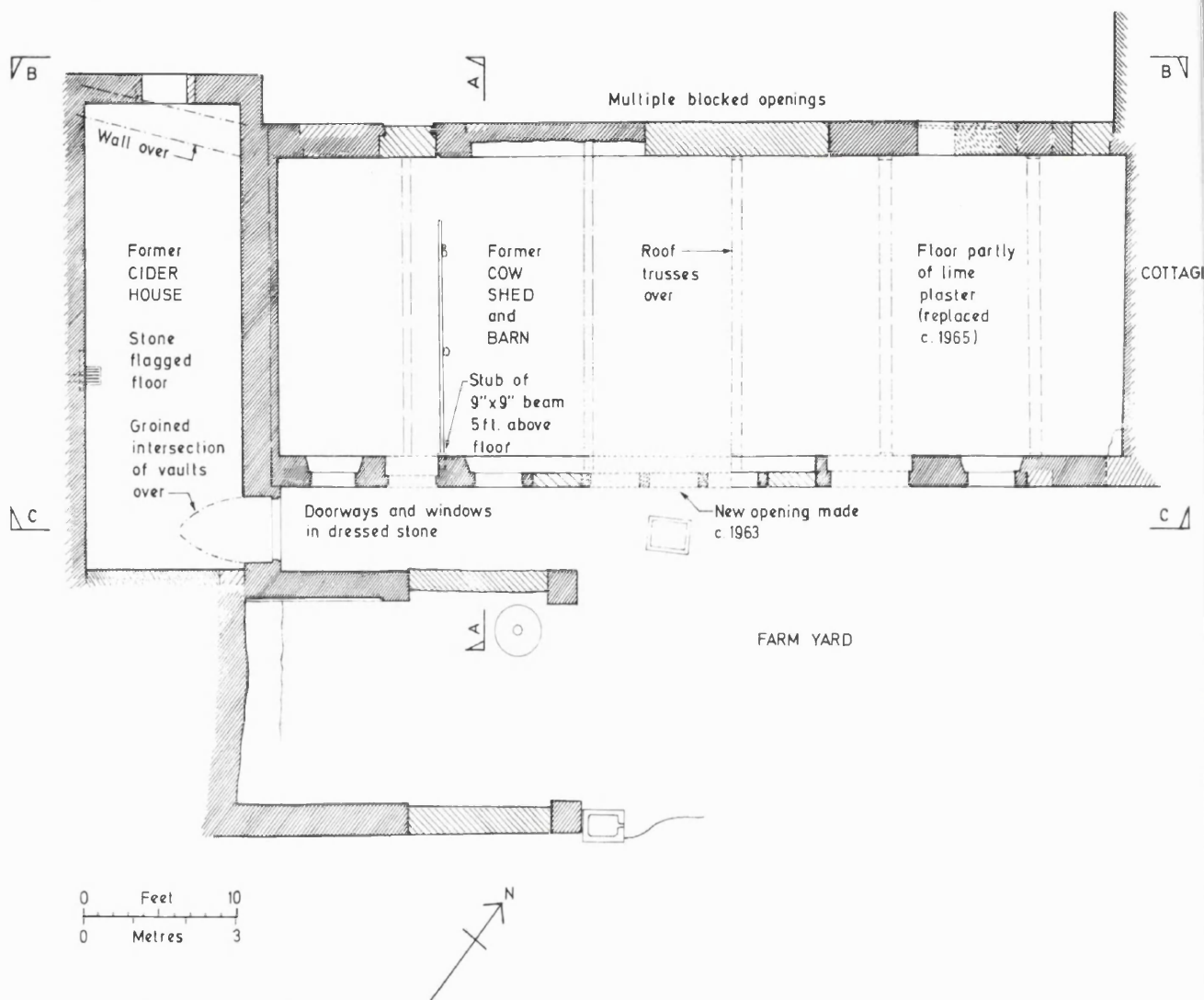


Fig. 2a Plan of former cowshed at Mill Farm.

rebuilt in the Gothic style. A brick archway suitable for a cart to pass is incorporated internally.

Adjoining this cottage is the one-time cowshed (Figure 2), a single-storeyed building with handsome doorways and the remains of a line of shuttered windows unsuited to an agricultural purpose, all with fine dressed stone surrounds in a

vernacular style, probably of the first half of the eighteenth century. The rear wall shows signs of many changes and repairs, indicating a succession of doorways including a broad cart entrance. This building was last altered in the 1960s to form a garage and workshop. Remains were found of a lime-plaster floor surface, a suitable precaution against the striking of sparks if gunpowder were handled here.

Set into the hillside at the end of the cowshed is a vault which was used as a cider house in the earlier twentieth century. Such a building would be suitable for the safe-keeping of inflammable materials. Its vernacular-style doorway has a stone surround similar to two in the cowshed, but the elliptical tunnel-vaulted roof is built of red bricks (net dimensions 9 in. by 4.5 in. by 2.25 in.) which were in limited use in the Bath area from the early eighteenth century.²² Beneath the turf in the steep hillside beyond the vault, and aligning with the end of the cowshed, are the foundations of a line of

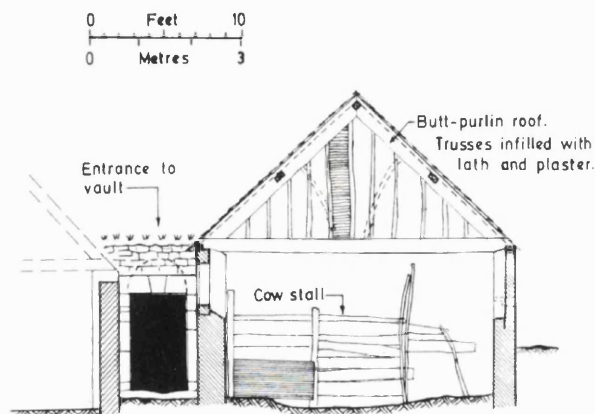


Fig. 2b Sectional elevation on A-A, of former cowshed.

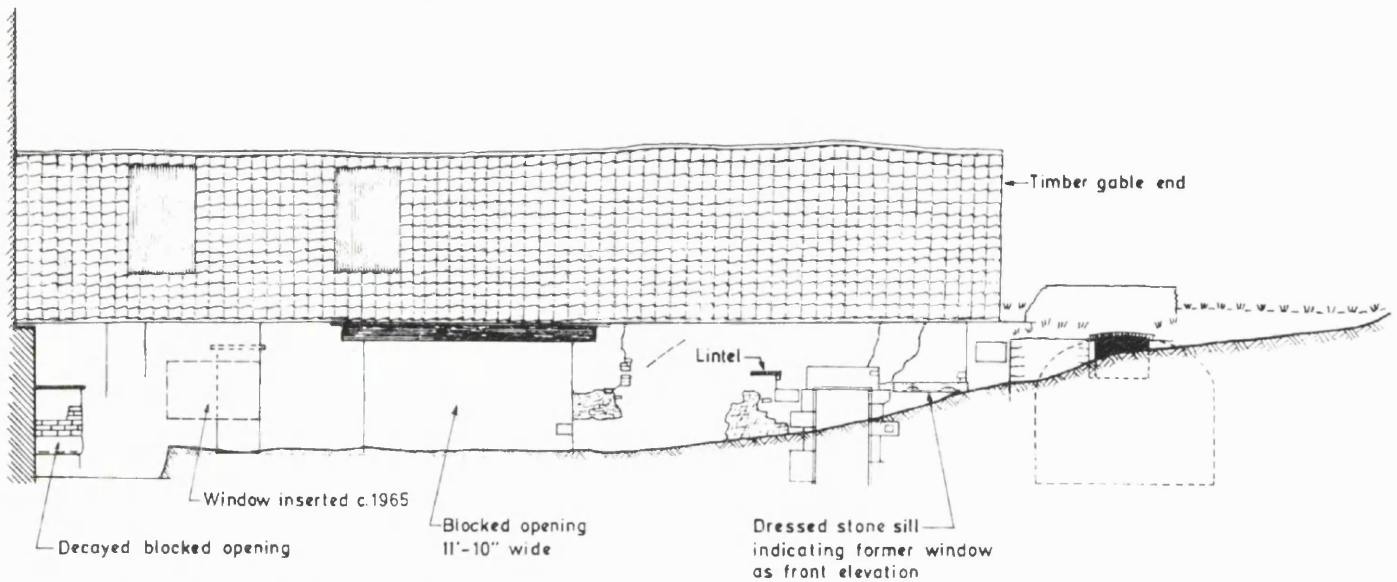


Fig. 2c Elevation on B-B, of former cowshed.

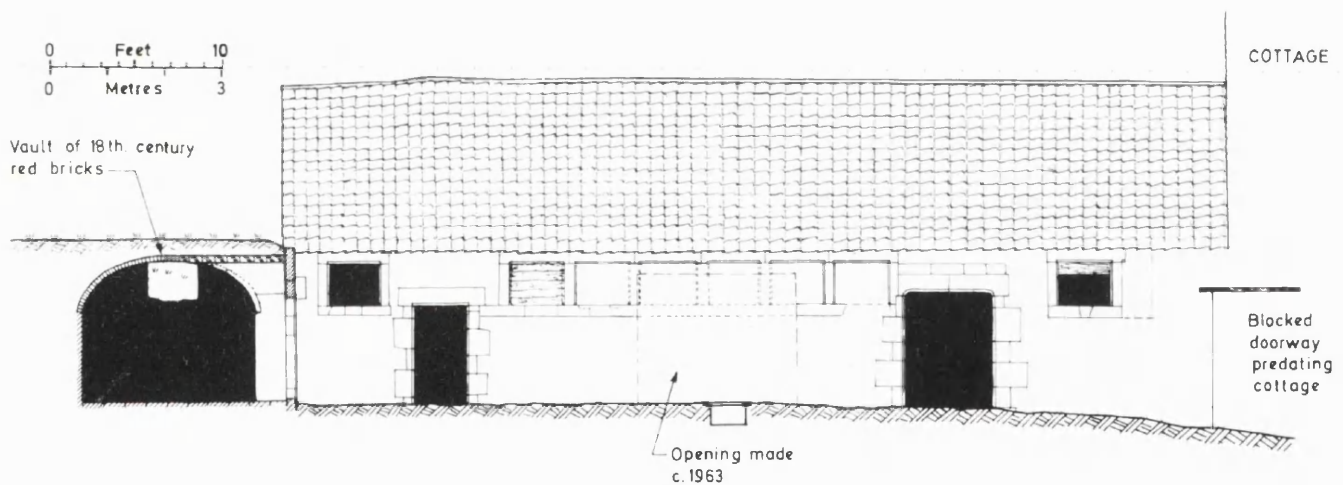


Fig. 2d Elevation on C-C, of former cowshed.

stone piers. This may be the site of the pointed-arched aqueduct depicted in a pencil sketch of 1826 (Figure 3).²³ It shows an aqueduct carrying a pipe which terminated in a water tower raised above the roofs of the buildings below. By this date the powder mill would have been out of use for over 20 years so the absence of a water wheel is not significant. The available power would not in any case have been great. The water came via a 4in square rubble stone conduit or 'drock' from a spring 300 yds to the west (ST 747689) and this small but silt-free supply, which still provides drinking water, may have been valued particularly for purifying the ingredients and other processes.

At a small distance downhill from this group is



Fig. 3 Woolley Powder Mill as it appeared in 1826: from a sketch by Dulcibella Chester.

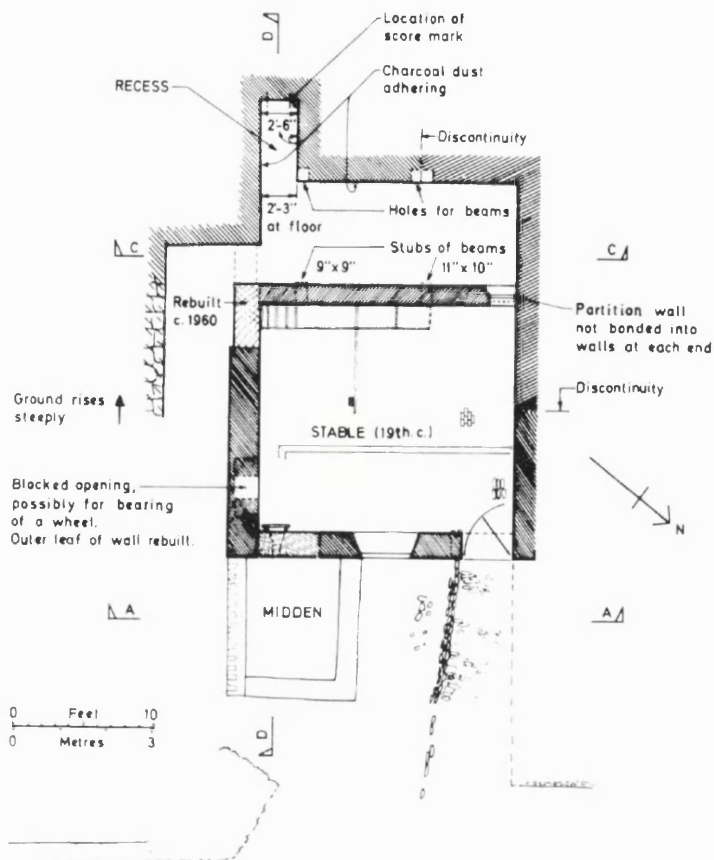
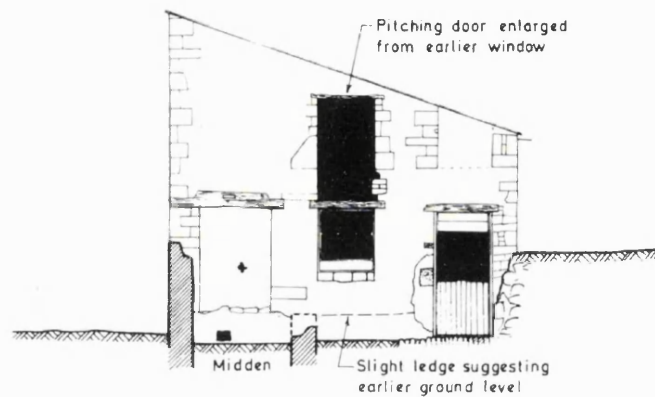
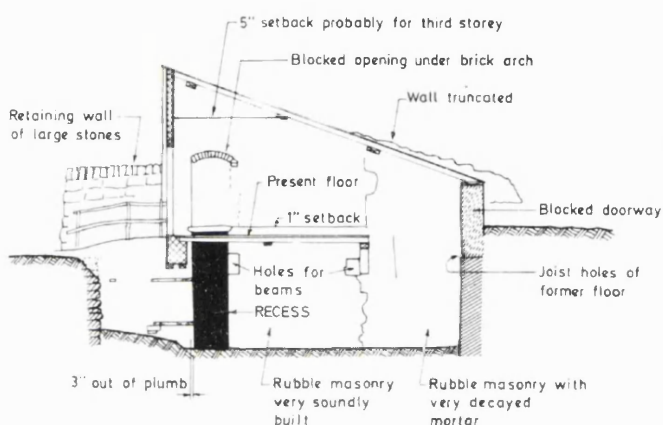


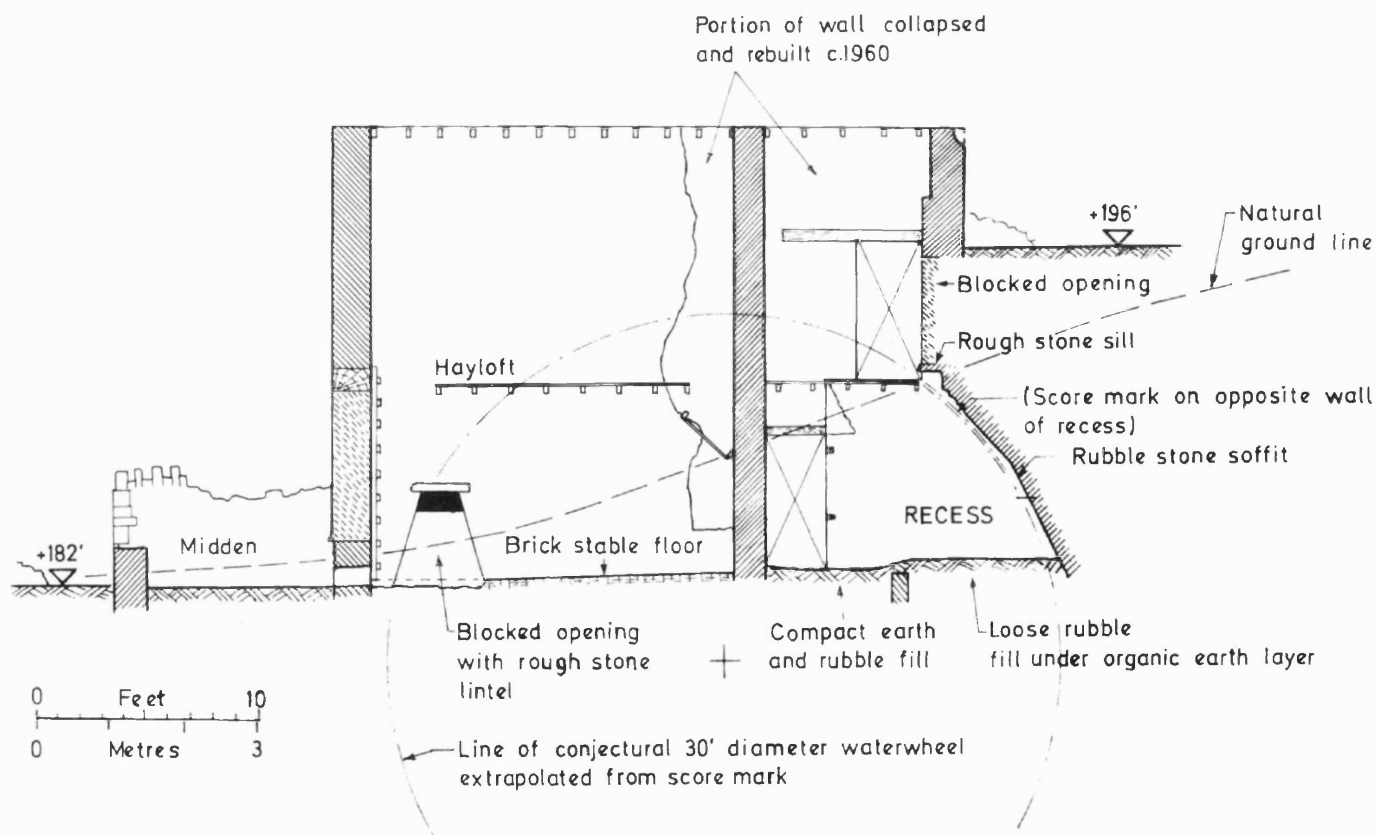
Fig. 4a Plan of lower floor of Stable, at Mill Farm.



Figs. 4b (top),



4c (middle)



4d (bottom): elevation on A-A, C-C and D-D respectively of stable.

the building used until recently as a stable (Figure 4). This much decayed structure evidently had three storeys at one time, but it shows signs of having undergone several major alterations and partial rebuildings including changes of floor level. It retains features indicating the use of water power, for, unlike the buildings hitherto described, it lies below the upper mill pond and the minor leat from Woolley, and could have received water from one or both sources. These features are discussed in the appendix. They include a recess in the rear wall which, from detailed examination, is considered to have contained a waterwheel with a diameter of 30 ft.

If the application of water power in this part of the site was limited to the stable and any other buildings which may have been below the level of the upper mill pond, this suggests that the buildings close to the manager's dwelling housed only the comparatively safe though possibly unpleasant refining processes for which no power driven equipment was needed. It is therefore in the vicinity of the cowshed that the sulphur may have been distilled and the saltpetre boiled and crystallized, all of which operations required space, heat, vats and vessels, and a limited supply of water which could have been drawn from the aqueduct. The stable building, with its power driven equipment, may have functioned as a crushing shed, treating the materials before or after refining was undertaken.

In this context it is worth noting that in the 1728 sketch of the Chilworth powder mills mentioned earlier, apart from the four incorporating mills, there was only one building which was designated a mill, and that was the 'Coal and Brimstone Mill'. The use of the stable building for the crushing of charcoal appears to be confirmed by a black powdery deposit about one sixteenth of an inch thick which adheres to parts of the rear wall within and adjoining the recess described elsewhere. Chemical analysis has shown it to be carbon, largely free of soluble salts, and microscopic examination has revealed the fibrous and perforated conductive-tissue structures of charcoal from broad-leaved trees, thought to be willow.

After the preparation of the raw materials the next and most hazardous stage of manufacture was the intimate mixing of the three ingredients in the incorporating mills, four of which were mentioned at Woolley in the memorandum of 1747/9. It is not likely that these would have been near the dwelling-house because of the danger of explosion, and they must therefore have constituted part of a separate group or groups of buildings concerned with the production of the gunpowder rather than its preparation, and requiring a steady supply of water power. For clues to their location it is necessary to return to the upper mill pond which probably represented their source of power supply.

The embankment of this pond (formerly 0.33

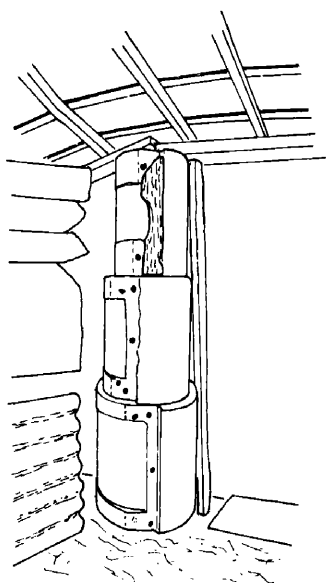


Fig. 5a Perspective sketch of pillar in outhouse.

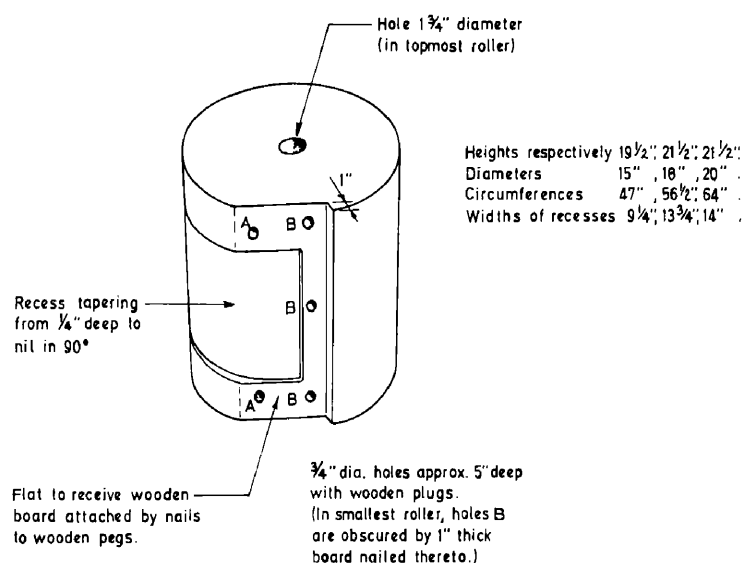


Fig. 5b Detail of one stone roller from pillar.

acres) stands 10 ft high on the downward side, supported at its eastern corner by retaining walls which are up to 7 ft high and built of rubble stone blocks of cyclopean size. On the bank of the pond are three yew trees whose girth is consistent with a mid- or late-eighteenth century planting, perhaps contemporary with the two yew trees in the churchyard at Woolley, laid out by Elizabeth Parkin in 1761. Changes of alignment and coursing suggest that there were buildings against the walls, of which the present pigsties and animal sheds are the successors. Supporting the roof of one of these sheds are the three cylindrical rollers already mentioned. Placed end on end they make a pillar 5 ft 3 in. high (Figure 5). They are of soft Bath stone, unsuitable for any pulverising function, and are respectively 15, 18, and 20 in. diameter, and an estimated 270, 340, and 550 lb in weight. They have a flat cut on one side, with fixing holes and a broad chase $\frac{1}{4}$ in. deep, probably designed to receive a circumferential belt of cloth or leather held in place by a piece of wood fixed to the flat. They may have been used for pressing the powder after its incorporation and for this purpose an oscillating motion can be envisaged. Other finishing processes which may have been water powered in similarly sited buildings were those concerned with the glazing of powder in rotating barrels, and its screening in revolving wooden frames to remove dust.

It seems likely that the incorporating mills were accommodated on the ground between the upper and lower mill ponds. There is about 35 ft difference in level between the ponds, and after an allowance for drawing down the upper pond by 7 ft or so to exploit its storage capacity, there would be room to place one or more large diameter wheels at a single level, or pairs of small overshot wheels of about 12 ft diameter at two levels in series. However, the upper wheels of such pairs could have been required to power auxiliary processes in the stable and other buildings, rather than the incorporating mills, so one or two of the latter could have been sited below the lower pond. The arrangement which best accords with the mid-eighteenth century statement that 'The water is worked twice over' is open to debate and divides the present authors. It may in any case have been modified later.

The penstocks to feed these water wheels from the upper pond cannot now be traced, and no positive evidence of the incorporating mills survives above ground, perhaps because of the practice of dismantling such structures when they went out of use to avoid the risk of explosion of accumulated

dust.²⁴ However, two probable sites, both a few feet above the lower pond and 100 yds apart, can be identified in areas of uneven ground adjoining underground watercourses. One of these is a stone drain, 12 in. by 12 in., which takes water from the low-level outlet at the north end of the upper pond. The other drain, 15 in. deep by 20 in. wide, runs from the vicinity of the stable building and would have received the tail culvert of the latter. The precise layout of these features could be established only by excavation.

The amount of time devoted to the incorporation of any one batch of gunpowder was very closely controlled, but there is at Woolley no surface evidence of the clock tower which remains a prominent feature of the comparable site at Littleton, now Powder Mill Farm.²⁵

The lower mill pond is retained by an earthen bank above the Lam Brook. It is now 0.4 acres, having been doubled in width since the 1839 tithe map was drawn, probably to compensate for the silting-up and abandonment of the long leat to the upper pond. It was fed by both the spent water from the upper pond and by the 150 yds leat already mentioned. Although the total fall was about half that from the upper pond, more water could be taken advantage of here as a major tributary joins the brook between the two dam sites. Until 1935, when the brook cut round the end of the dam in a cloud-burst, this pond supplied a small corn mill which has since been converted into a dwelling house. The mill had a style and layout which suggested a nineteenth century construction. In particular it had a pitchback water wheel, about 17 ft 6 in. diameter and $3\frac{1}{2}$ ft wide with a rim drive, until a turbine was installed around 1925.

This corn mill post-dated the powder mill, but on the other side of the wheel pit is a building of unusual layout, now Mill Cottage, which appears to have had an earlier industrial use (Figure 6). It comprises living quarters on one floor above a semi-basement excavated into the hillside and measuring 18 ft by 30 ft. This was formerly completely open at the front and was used as a cart shed of more than ample size. There are blocked circular and semi-circular openings available for shafting in the wall facing the wheel pit. The layout is unlike that of a corn mill, and it is probable that this building played some part in the powder making process before being converted into a cottage in the first half of the nineteenth century, perhaps for the miller when the corn mill was rebuilt and the site reverted to its agricultural role.

It is impossible to be conclusive about the earlier

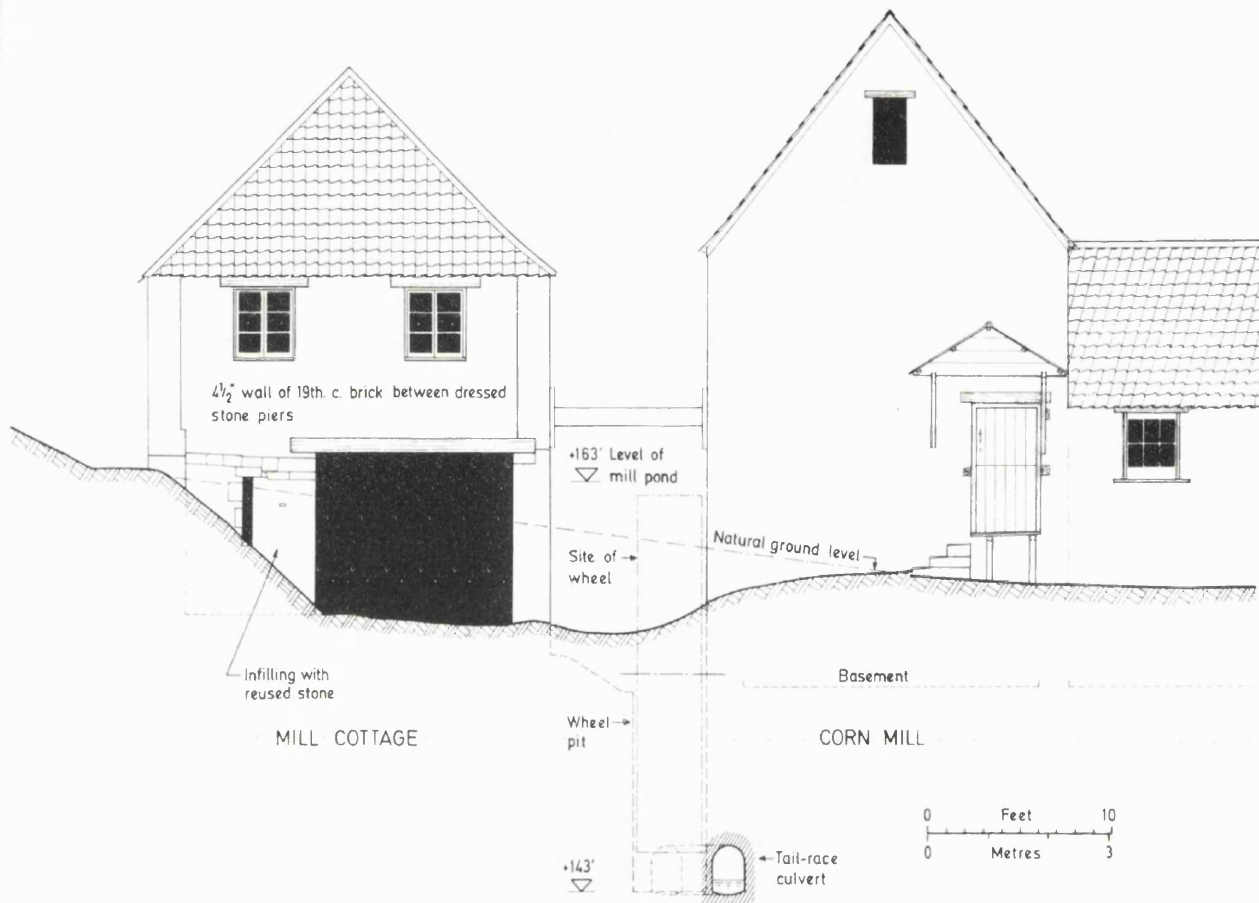


Fig. 6a Mill and Mill Cottage, front elevation.

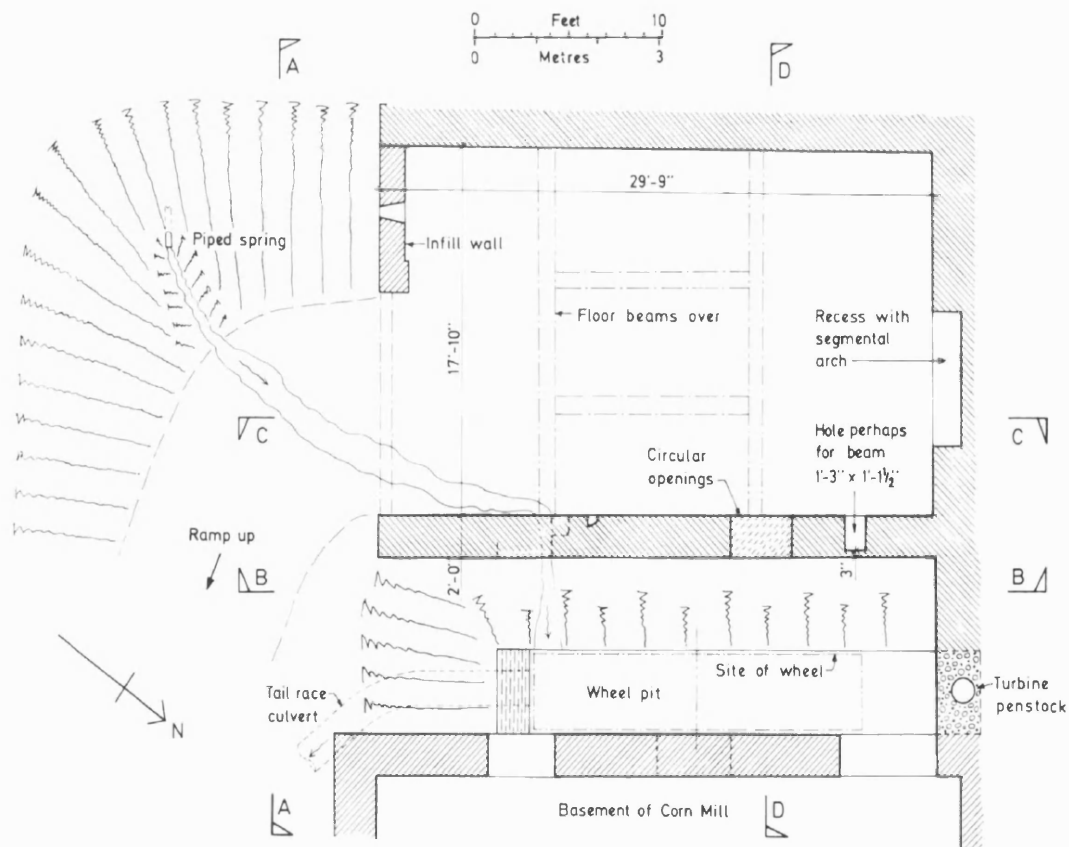


Fig. 6b Lower floor plan, Mill Cottage.

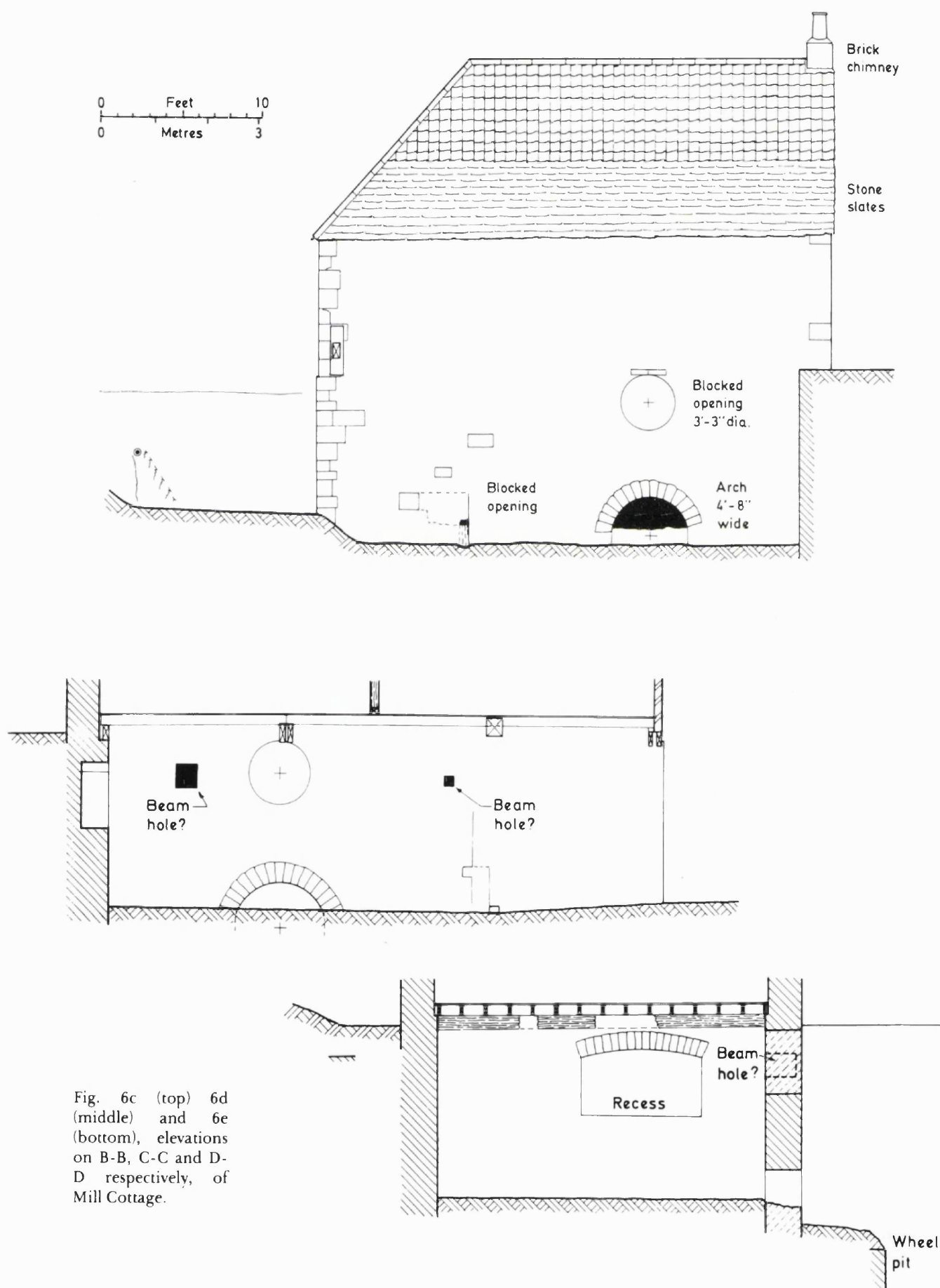


Fig. 6c (top) 6d (middle) and 6e (bottom), elevations on B-B, C-C and D-D respectively, of Mill Cottage.

function of the Mill Cottage. In layout and size it could have been well-suited as an incorporating mill, for whereas light constructions were often favoured in the nineteenth century as the best way of minimizing the hazards attendant upon an explosion, the solid masonry here accords with the eighteenth-century practice of having three heavy walls to channel the blast.²⁶ Furthermore it would be reasonable to expect the partners to make the fullest use of the site they had leased, and the evidence of extensive work on the tailrace in order to gain extra fall suggests that they did seek to use a building in this vicinity for power-intensive purposes, such as incorporation.²⁷ However, the reference in the lease of 1729 to the 'new Powder Mills' served by the new cut suggests that initial investment was not at the corn mill site, while the only major building work specifically recorded in the balance sheets from the 1740s to the 1800s is that for a new magazine in 1753.

Just upstream of the outfall from the tailrace (ST 751687), an arch passes through the neck of a small meander of the brook and serves no immediately apparent purpose unless as a by-pass to a water-powered site. The bed of the brook here would have been an opportune location for an undershot wheel with a fall of up to 5 ft. Other features near the cornmill include two areas of stone foundations

buried in the embankment of the mill pond, and an isolated section of retaining wall in the bank of the brook below. This suggests that there were further installations in that vicinity, and the tithe map of 1839 does indicate a building on the side of the mill pond there. While other powder mill sites are characterized by widely separated buildings to minimize the consequences of explosions, the scatter of possible installations at the lower end of the Woolley site may also reflect the difficulties of obtaining power.

The picture which emerges from this consideration of both the documentary and the physical evidence is that of a cascade of water-driven installations down the hillside, effectively at right angles to the flow of the brook (Figure 7), and thus in contrast to the linear arrangement along a head leat parallel to the stream that characterizes most gunpowder works. Whether the production flow pattern was as straightforward is more doubtful, and it may have varied over time as facilities were added or altered. The limited evidence suggests that after the preparation of materials at the top and middle of the site, they passed downhill to the incorporating mills, and then to a number of water powered locations for the finishing processes. After drying, the powder would be stored in a magazine at a considerable distance from the other activities,

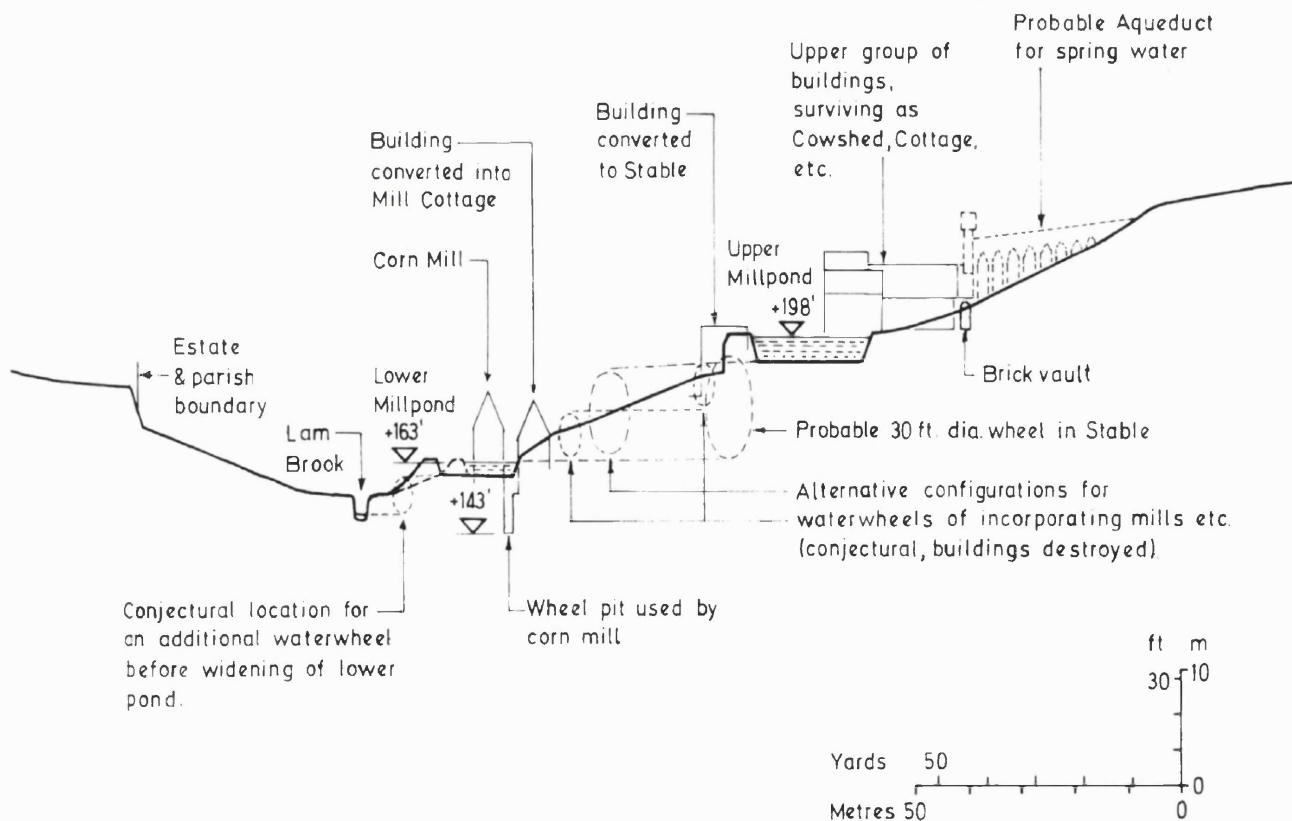


Fig. 7 Schematic cross-section of gunpowder mills site as viewed from the north-west: see X-X- on Figure 1.

perhaps on the further side of the brook, but no trace of a building survives above ground. The easiest route for the finished powder to leave for Bristol would be up the lane on the far side of the brook, still called Powdermill Hill, and then north-westwards up the valley either to the Chippenham to Bristol road, or via Upton Cheyney and North Stoke to the Avon Navigation, so avoiding passage through Bath.

The present condition of this eighteenth-century manufacturing site has now been described, and an attempt has been made to relate the structures still remaining to those other features integral to the process of powder making for which no visual evidence now survives, and to interpret this evidence in the context of the likely pattern of power and production requirements. On the basis of this exercise it is possible to suggest a technological rationale behind the apparently random scatter of buildings, namely that of making the fullest possible use of the water power available.

It is not intended by this interpretation of the Woolley site to invest the layout with a greater significance than it should bear. This scattered alternative to the linear arrangement of some other powder works probably represented a pragmatic response to the topographical restraints of the site rather than a positive reason for choosing Woolley. Indeed to the first proprietors of the 1720s the attraction of the site was more likely to be its convenience, firstly in the geographical sense because it offered the combination of accessibility and seclusion already referred to, and secondly in an administrative way because it was owned as part of the Manor of Woolley by William Parkin, brother of one of the original partners and himself a London merchant with whom a trade balance was maintained in the early years. On his death the property passed first to his niece Elizabeth Parkin,²⁸ and then to her nephew Matthew Worgan,²⁹ both of whom functioned as partners as well as landowners so that a close relationship between lessor and lessees continued for much of the eighteenth century.

The Significance of the Woolley Powder Works

The last question to be considered is that of the general importance of the Woolley mills, and it is as difficult to draw any neat conclusions about this matter, as it was about the possible arrangement of the site. This is largely because their significance varies according to the context within which they are viewed. First, from the point of view of the level

of technology employed, it cannot be claimed that any great degree of expertise was displayed. It is true that incorporation seems always to have been by rollers rather than stamps, so it is possible there were some ways in which the Woolley works were ahead of contemporary practice.³⁰ On the other hand the making of gunpowder remained an art and a mystery, and a sequence of letters from the early 1760s portraying the company's efforts to obtain government contracts impress by the haphazard nature of the enterprise. The partners were urged by Sir Charles Frederick of the Board of Ordnance to '... keep *one Mill* at work trying experiments (for a little while) on different Compositions different times of grinding etc by which means we may hit on the right methods as others have done'.³¹

Second, from the point of view of their role in the area the importance of the Woolley works appears to have been slight. Their rural seclusion has already been noted, and this physical isolation was symptomatic of a general detachment from the local economy. Charcoal was the only raw material purchased locally, and outlets for the sale of the finished product were limited by its nature. The numbers employed were never very large. According to the memorandum of 1747/9, twelve men were then engaged on the work, and even if that number doubled in the course of the eighteenth century on the assumption that the doubling of the capital invested in buildings and equipment³² duplicated existing provisions, rather than having a strong labour saving element, the impact on employment is unlikely to have been very great beyond the immediate locality.³³ Indeed it seems likely that as far as personnel were concerned the links with Bristol were stronger than those with the neighbourhood, for not only were most of the proprietors and trading associates resident there, but the names of many tradesmen and craftsmen mentioned in the Woolley balance sheets have been found in the Bristol directories of the time.³⁴ These included coopers, braziers, plumbers and carpenters, showing that in matters such as the making of the vitally important barrels, the partners preferred to employ men skilled in the port trades rather than the rural craftsmen.

This reference to the links with Bristol introduces a third context, and one in which the Woolley works were of greater importance. Not only did they become through Bristol a part of an international trading network, importing raw materials from the Mediterranean world, the Baltic and India, and shipping the finished product to the

African coast, Ireland and North America, but they also functioned in north Somerset as an outpost of the Bristol merchant interest. They were in fact one of several such manufacturing enclaves (of which other examples are the brass, copper and glass industries) which flourished on rural sites offering facilities not easily found in the growing city of Bristol, such as space for development and a good supply of water. A special stimulus to the founding of such enclaves in the early decades of the eighteenth century may have been provided by the growth of the slave trade, from which the outports had been excluded until the turn of the century, but in which Bristol came to achieve an important but short-lived dominance, overtaking the London interest in the 1720s and 1730s before being itself overtaken by the competition from Liverpool in the 1740s. The significance of this trade was two-fold, for it both provided the Bristol merchants with surplus funds for investment, and stimulated industrial enterprise by the market it offered for manufactured products. Slave barter goods carried by ships sailing for the coast of Africa commonly included copper, brass and iron ware, gunpowder and muskets, cotton pieces and fine hats, cowries and glass beads, brandy and gin.³⁵ The demand for gunpowder was such an important feature of this trade that in addition to their magazine in Bristol³⁶ the Woolley partners had a depot in the port of Liverpool.³⁷ The products of the plantations to which slaves were shipped in the West Indies and the southern colonies of North America, for example sugar, tobacco and cotton, were brought into the western seaports on the last leg of this triangular trade.

The importance of this trade in musket powder, however, must not lead to a neglect of the continuing production of blast powder for use in mining, especially as it was the recurring purchase of the same in a local coal mining account which prompted speculation about its source and so led to the papers analysed in this study. The use of powder for this purpose probably came early to this region, for reports of its employment in lead mining in the mid-1680s³⁸ followed closely upon its introduction for blasting at the Ecton copper mine in Staffordshire in about 1670,³⁹ whilst by 1719 there is evidence of its use in north Somerset coal mines.⁴⁰ But important though the stimulus of the local market must have been, it was once more the links with the port of Bristol which enabled the Woolley partners to sell their product more widely, particularly in Wales and Cornwall.⁴¹

By these references to the two widely different

functions of gunpowder we approach the fourth context in which the importance of Woolley must be considered, that of its place in the changing pattern of powder making in England. Until the establishment of the group of north Somerset mills in the early eighteenth century, the only significant sites of powder making had been in Essex, Middlesex, Kent and Surrey, most importantly at Waltham Abbey,⁴² Faversham⁴³ and Chilworth (see earlier reference). The origins of this group lay in the mid-sixteenth century and they produced powder almost exclusively for military and naval use. Of the mills founded later than those of north Somerset perhaps the most important were in Westmorland and Furness, mentioned earlier, dating from the later decades of the eighteenth century and producing powder chiefly for use in mining. For much of the eighteenth century therefore, the north Somerset mills occupied an important position in the chronology and geography of powder making, supplying products for use in both mining and musketry in the immediate region, the western seaboard, the Africa trade and the American colonies, thus meeting new needs in new markets. It may be suggested that the greatest significance of the Woolley works lay in the part they and the other north Somerset mills played in the shifting location of powder production and trade in the eighteenth century.

In 1803 the Woolley partners entered into an agreement with the proprietors of the Littleton powder works some 10 miles south of Bristol, by which the two firms were to be 'consolidated'.⁴⁴ As the Woolley lease was close to expiry whilst the Littleton site was freehold and owned by the partners, it was decided to close down the former and concentrate production at the latter, thus bringing to an end 80 years of profitable powder making at Woolley. This rationalization was undertaken because by the end of the eighteenth century the productive capacity of the mills in the Bristol area greatly exceeded the demand they had to meet. The African trade had declined⁴⁵ and at the same time the North American market had also become vulnerable. Although trade with the United States had in general revived after the hostilities of the Independence War, the set-back in some commodities had continued as home produced goods replaced those previously shipped across the Atlantic. This was the case with gunpowder as the Du Pont and other mills began to supply the needs of this greatly expanding market.

The urgency of the situation produced by these declining markets can be established by comparing

information from two documents relating to production figures. In the first, the memorandum of 1747/9, it was stated that the Woolley works produced 2,000 to 4,000 barrels of powder each year, a barrel containing 100 lb. In the second, a paper of 1802 setting out the position at both the Woolley and Littleton mills, it was stated that in the past 8 years the former had produced 8,846 barrels and the latter 8,942 barrels, the partners' capital employed at both being the same, namely £12,000.⁴⁶ These figures suggest that for each of the previous 8 years the two mills had together been producing only as much as, and possibly less than, Woolley alone in the 1740s. The decline in overseas markets had thus left the mills with a productive capacity which not even the conditions of war had caused to be fully employed. The growth and diversification of the Du Pont mills shows that there was no lack of development possibilities in this industry, but these depended on an investment in new technology which was not forthcoming in the north Somerset mills. The Woolley site therefore reverted to its agricultural status, a fate which befell the other powder mills in the area in the course of the early decades of the nineteenth century.

Appendix: Discussion of features in the stable building related to the use of water power.

The one-time stable is built into a steep bank below a level, embanked area which may have been a small pond. In the rear wall of the building, at a point suitable for an outlet from this pond, there is a blocked opening, terminated by a stone sill, and immediately below this there is a deep recess, 2ft 6in. wide, with an inclined soffit or 'breast', (See Fig. 4d). In one wall of the recess is a chase, about a quarter of an inch deep and 2 in. wide, on a slight but regular curve of 15 ft radius. This would seem to be the score mark made by a high-breast waterwheel about 2 ft wide and 30 ft in diameter. Probably no examples of such large wheels survive from the eighteenth century, but several are documented, e.g. overshot wheels by Smeaton at Alston, Cumberland, (c. 1785) and Woodhall, Northumberland, (1775), and the Great Wheel at Broseley, Salop.

Before the construction of a partition wall and floors, the backfilling of the wheel pit and the raising of the lower floor level, such a wheel would have fitted very neatly within the building. Its lowest point would have been about 1 ft above the surface level of the lower mill pond, giving a net fall of 27½ ft, and it would have been ideal to exploit the high head and limited supply of water at the site, although excavating and maintaining a wheel pit in clay soil to a mean depth of over 20 ft must have presented considerable difficulties. Some of the masonry of the stable building is of a different period, probably earlier than the construction of the wheel recess, so

perhaps there were earlier installations precluding the siting of the wheel further down the hillside where it could have stood largely above ground.

There is evidence to suggest that instability of the wheel pit caused the wheel's demise, for the outer (south-eastern) wall of the recess is out of plumb and bulges inwards by 3 in. at the present lower floor level (see Figs. 4a and 4c). A progressive movement of the side of the pit could have led to the score mark on the opposite wall and the eventual stopping of the wheel. Further evidence that the wheel had a limited life is provided by the absence of significant incrustations of lime from the hard water of the district and by the presence of deposits of charcoal dust which water would have washed away. Deposits of lime at fissures in the masonry do suggest that the water-course above was maintained for a longer period, and a smaller wheel of overshot type could have been substituted, either internally or externally. A blocked opening in another part of the south-eastern wall (see Fig. 4d) has the appearance of a bearing arch and could have carried the shaft of this later wheel.

A trial excavation to determine the extent of the wheel pit proved inconclusive, revealing compacted earth and rubble fill and no sign of the north-western wall of the pit within 3½ ft of the present floor level, but the original floor was probably lower. A transverse wall across the mouth of the recess separated two different types of fill, perhaps of different periods.

Acknowledgements

We wish to thank the Somerset County Archivist Mr D. M. M. Shorrocks, and his colleagues, for facilitating the use of the Strachey papers, and the various owners of the Woolley site, especially Mrs E. Hitchcock and Mr I. Crudginton, for allowing access for inspection and measurement. Our thanks are also due to Professor W. Ashworth and Dr C. G. A. Clay of the University of Bristol, Dr P. Carr for chemical analysis, Mr D. E. Tucker for microscopic examination and the tracing of Figure 3, Dr R. A. Buchanan and Dr S. M. Linsley.

Notes and References

- 1 Robin Atthill, 'The Gunpowder Mills of North Somerset', *The Countryman* (1971), 134-9. R. E. M. Peach, *Annals of Swainswick* (1890), suggested that there was a powder mill at Dead Mill in the parish of Swainswick, a mile downstream from the Woolley works, but the evidence may have been misinterpreted.
- 2 C. R. Sanders, *The Strachey Family 1588-1932* (Duke University Press, 1953).
- 3 The Strachey papers are housed at the Somerset Record Office (SRO). In the documents studied in this research (DD/SH Box 27) the undertaking is usually referred to as the 'powder works' although the local usage, traditional and continuing, is 'powder mill'.
- 4 B. J. Buchanan, 'Capital Formation in North Somerset, 1750-1830', thesis submitted to the University of Bristol (1979).

- 5 B. J. Buchanan, 'A Comment of the Manufacture of Black Powder', *Journal of the Society for Industrial Archeology*, 2 (1976), 75-80.
- 6 D. W. Warner, 'The Early History of Gunpowder Manufacture at Chilworth', *Surrey History*, 1, 3, 99.
- 7 Joseph Needham, 'The Guns of Khaifeng-fu: China's Development of Man's First Chemical Explosive', *The Times Literary Supplement* (11 January 1980), for a consideration of the early history.
- 8 'Mem^d relating to Gunpowder Works'. There are two dates on this note, July 1747 and July 1749.
- 9 *ibid*, 'Charcoal made of Alder wood costs deliver'd on the spot 13^d p bushell'. Alder grows widely along the banks of the Lam Brook and in woods adjacent and Aldermoor is a recurring field name.
- 10 Sulphur came from the Mediterranean world, especially Sicily and Italy, and saltpetre from the Baltic and India.
- 11 Agricola, *De Re Metallica*, ed. H. C. Hoover & L. H. Hoover (New York, 1950), 561-4; Denis Diderot, *Encyclopedia of Trades and Industry*, ed. C. C. Gillespie (New York, 1959), plates 150-8; ed. Charles Singer et. al., *A History of Technology* (Oxford, 1956) II, 369-71, 374-82, and III, 683-5. Brimstone or sulphur was refined by distillation, the vapour passing through large earthenware pots. Petre, or potassium nitrate, forms naturally in humid soil containing decaying vegetable or animal matter. Water was percolated through this nitrogenous earth heaped in vats, the resulting solution being boiled and cooled until crystals precipitated. Three recrystallizations usually took place.
- 12 Letter from Henry Strachey in London to Edmund Baugh in Bristol, managing partner, 15 December 1761, reporting the view of Sir Charles Frederick that the defect in their powder was '... most likely owing to want of refining the petre well of its Sea Salts and other Dross, or want of well drying after it is refined, to want of refining the Sulphur, or an undue proportion of the Ingredients'.
- 13 Swainswick Parish Registers, transcription by Revd C. W. Shickell, Bath Reference Library.
- 14 Letter from Isaac Baugh in Bristol to Henry Strachey in London, 5 December 1761.
- 15 For a description of the changes in the process of powder making see Robert A. Howard, 'Black Powder Manufacture', *Journal of the Society for Industrial Archeology* (1975), 13-28.
- 16 The site plan and measured drawings are by Malcolm Tucker. Some 50 annotated drawings are being deposited in the National Monuments Record, London, and the Bath Reference Library. Some of the structures have seriously deteriorated since drawn in the late 1960s. The site is private property.
- 17 'A Lease from William Parkin Esq. to Abraham Hooke Esq. and others of the Mills at Woolley, 9 February 1729'.
- 18 Based on information supplied by the Wessex Water Authority. The flow would have been slightly greater before 1925 when the Bath Corporation Water Works tapped some of the headsprings at Langridge.
- 19 Letter from George Dyer in Bristol, managing partner, to Henry Strachey in London, 11 March 1801.
- 20 From the information available estimates of horsepower must be speculative. With a depth at outlet of about 7 ft, the volume of the upper pond may have approached 90,000 cubic ft (about half a million gallons) when constructed, but allowing for silting perhaps half of this was usable. With a flow of 1 cubic ft per second, or about twice the minimum dry weather supply, the pond would have filled in 12 hours. If two lines of mills worked in turn for six hours each, the outflow during a 12 hour day would be 2 cubic ft per second.
- If this worked two 12 ft diameter overshot wheels in series, the power from each wheel would be about 2 horsepower, or 4 horsepower total. At least an equal amount of power should have been available from the lower pond.
- 21 Thomas Thorpe, 'An Actual Survey of the City of Bath in the County of Somerset and of Five Miles Round' (1742). Proprietary maps of the late eighteenth and early nineteenth century are copied from Thorpe. The Ordnance Survey, sheet XIX, 1817; the Tithe Map of Woolley, 1839, SRO; and William Sander's Geological Map, sheet 11, 1860, all disagree as to the arrangement of buildings and must be regarded as schematic. The Ordnance Survey, 1881-5, the first accurate survey, shows a layout close to that of the twentieth century.
- 22 Mr Peter Coard, personal communication. The abundance of stone in this area makes brick an unusual material. A cottage which stood until 1970 at Ferndale Road (earlier Brick Lane) in the adjoining parish of Swainswick (ST 763671) was built of red brick of the same dimensions as those at Woolley. It has been dated to the first quarter of the eighteenth century on the basis of details of the stone mullioned windows. Although the elliptical arch is generally associated with the late eighteenth and nineteenth centuries, relieving arches of this shape are seen in vernacular-style domestic buildings of the seventeenth and early eighteenth centuries in the Bath area, including the cottage referred to above, which had a shallow segmental vault of brick in the basement.
- 23 Dulcibella Chester, 'Woolley Powder Mill, November 1826', reproduced *Bath & Wilts Chronicle & Herald* (19 September 1932), 3.
- 24 Paul N. Wilson, 'The Gunpowder Mills of Westmorland and Furness', *Transactions of the Newcomen Society*, XXXVI (1963-4), 47-65.
- 25 A letter from Matthew Worgan at Woolley, works manager, to Isaac Baugh in Bristol, 22 February 1762, shows the importance of timing.

'I have sent 2 bottles of powder for tryal at the Office of Ordnance One Mark't ⊕ which has been work't 6 hours and the other mark't * which has been work't 5 hours, both the same Composition ... I believe Mr Strachey had best introduce them to the Board as two different sorts of powder to be tryed, because if he acquaints them with the difference, they will undoubtedly require that we always come up to the best proof, Whereas the other may be passable, as they are both very good.'
- 26 Howard, 'Black Powder Manufacture', 21-3.
- 27 Examination of the wheel pit through a modern manhole suggests that the bottom is some 4 ft below the dry-weather level of the brook at its nearest point. The tailrace runs parallel to the brook for 160 yds downstream, in an arched culvert up to 16 ft below ground level, a particularly expensive way of gaining extra fall, except as the means of improvement of an established site, and better matched to the industrial enterprise of gunpowder making than to the small country corn mill.
- 28 The main home of Elizabeth Parkin (1703-66) was near Rotherham, and the Sheffield area remained the main centre of her interests. See B. A. Holderness, 'Elizabeth Parkin and her Investments, 1733-66: Aspects of the Sheffield Money Market in the Mid-Eighteenth Century', *Hunter Archaeological Society Journal* (Sheffield, 1973), 81-7.
- 29 John Worgan joined the Woolley partnership in 1740, with responsibility for the '... inspection and superintendancy of the works'. The family retained this association until the death of his son Matthew in 1793.
- 30 Howard, 'Black Powder Manufacture', 17, claims that as a powder maker Du Pont was 'the best in the country', but the

wheel mill was not used for the incorporation of ingredients at the Du Pont works until 1822.

- 31 Letter from Henry Strachey in London to Edmund Baugh in Bristol, 15 December 1761, reporting this advice.
- 32 Fixed capital at the Woolley works was for the purpose of the balance sheet estimated at £2,200 in 1745; by 1801 it was £4,000.
- 33 The closure of the powder works had no discernible impact on the numbers living in the valley. At the 1801 Census the population figures were: Woolley, 80; Langridge, 86; Swainswick, 182. Total, 348. In 1811 the total was 419, and in 1821, 585. *Victoria History of the Counties of England, Somerset*, 2 (London, 1911), 340–52.
- 34 In particular, James Sketchley, *Bristol Directory of 1775* (Kingsmead reprint, Bath, 1971).
- 35 John Latimer, *The Annals of Bristol in the Eighteenth Century*, 2 (Bristol, 1893, Kingsmead reprint, Bath, 1970), 143.
- 36 The magazine was at Tower Harris or Tower Harrazz on Temple Back, and gunpowder was stored there until the end of the eighteenth century. There are also references to a magazine at Hungroad. Warehouses in the Fryars were rented for the storage of raw materials.
- 37 Letter from George Dyer in Bristol, managing partner, to Henry Strachey in London, 18 April 1800, in which the matter of the renewal of the lease of the magazine in Liverpool was raised.
- 38 John Beaumont, 'On a New Way of Cleaving Rocks', *Phil. Trans. Royal Society*, XV, 167 (1684–5), 854.
- 39 J. W. Gough, *The Mines of Mendip* (Oxford, 1930, rev. edn. Newton Abbot, 1976), 167–8.
- 40 John Strachey, 'Observations on the Strata in the Coal Mines of Mendip', *Phil. Trans. Royal Society*, XXX, 360 (1719), 968.
- 41 Letter from Mr Wansey in Bristol to Henry Strachey in London, 17 July 1762, noting that because of wartime prohibitions the partners were unable to supply the 'Orders for ye Mines in Wales and Cornwall'. It should be noted that the first Cornish powder mill was not built until 1809, see Bryan Earle, *Cornish Explosives* (Trevithick Society, 1978), 28–9.
- 42 W. H. Simmons, *A Short History of the Royal Gunpowder Factory at Waltham Abbey* (Controllerate of Royal Ordnance Factories, 1963).
- 43 Arthur Percival, 'The Faversham Gunpowder Industry', *Industrial Archaeology*, 5, 1 (1968), 1–42, and 5, 2 (1968), 120–34.
- 44 Letter from George Dyer in Bristol to Sir Henry Strachey in London, 8 June 1803, with a 'Copy of the Resolution of the Littleton and Woolley Gunpowder Works for Consolidation, 7th June 1803'.
- 45 Letter from George Dyer in Bristol to Henry Strachey in London, 27 November 1795, 'We have lost our Africa trade ...'.
- 46 Letter from George Dyer in Bristol to Sir Henry Strachey in London, 28 January 1803, with a memorandum of 17 August 1802.

The first of these is the fact that the City of London has been a free port since 1554. This has enabled it to attract a large number of foreign merchants and to become a centre of international trade. The second is the fact that the City has been a centre of finance since the 17th century. This has enabled it to attract a large number of banks and financial institutions. The third is the fact that the City has been a centre of industry since the 18th century. This has enabled it to attract a large number of manufacturers and industrial firms.

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VOLUME 30 1982
PART II

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example in Cambridgeshire, where the small owner in the fenland village of Willingham continued to make a living, and was able to resist the incursions of large farms, whereas at Chippenham (corn-sheep) holdings of 15 to 40 or 45 acres disappeared in the period 1560–1636. Thus the small owner survived in one village, but disappeared early in the seventeenth century in the other. In the eighteenth century Wiltshire small owners declined rapidly in the chalk areas (corn-sheep), but they continued to dominate the cheese areas, which concentrated on dairy farming. Similarly in Lincolnshire small owners survived, and indeed still survive on the fens and marsh lands, while they disappeared on the wolds, heath and cliff, much of which was enclosed by legislation.⁶⁸ Taken together with the Cumbrian phe-

nomenon of large farms existing alongside the small holdings of customary tenants, this evidence reveals the importance of making local distinctions. Furthermore, such regional disparities remain apparent in the twentieth century. By the middle of the last century large farms (defined by then as over 500 acres) were found mainly in the south Midlands, East Anglia and the southern counties, while small farms (100–150 acres or less) predominated in the north-west, the north Midlands, Wales, the south-west, and the Lincolnshire fenlands. This cannot be explained entirely by the seventeenth- and eighteenth-century economic difficulties, or by parliamentary enclosure, although regional differences in the latter movement may help to account for the situation of large farms. The pattern of larger farms in the eastern and southern arable areas, and smaller in the pastoral lands, remains largely unchanged in the mid-twentieth century.⁶⁹ It suggests a complicated and diverse picture of small owner decline stretching from the sixteenth century and not finally complete today.

⁶⁹Grigg, loc cit, pp 268–79.

⁶⁸Margaret Spufford, 'Peasant Inheritance Customs and Land Distribution in Cambridgeshire from the sixteenth to the eighteenth centuries', in J Goody, J Thirsk and E P Thompson, eds, *Family and Inheritance*, Cambridge, 1976, pp 160–1. The theme is developed in her book *Contrasting Communities*, Cambridge, 1974. E Kerridge, 'Agriculture, 1500–1793', V C H Wiltshire, IV, pp 49–50, 59–60; D B Grigg, 'Small and Large Farms in England and Wales', *Geography*, XLVIII, 1963, p 270; Joan Thirsk, *English Peasant Farming*, 1957, p 2; W O Massingberd's review of Johnson, op cit, in *Lincolnshire Notes and Queries*, XI, 1910–11, pp 26–32.

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The Financing of Parliamentary Waste Land Enclosure: Some Evidence from North Somerset, 1770–1830¹

By B J BUCHANAN

I
HISTORICAL studies of enclosure, the process by which the system of cultivation was transformed from the traditional and corporate method of farming in common to the modern and individualistic one of farming in severalty, have tended to focus upon the arable open fields rather than upon the commons and waste lands.² Indeed, the changes in farming organization outside open-field England have been most informatively explored in recent years by those approaching the subject as geographers, although attention has then necessarily been concentrated on the physical rather than the economic aspects of change over time.³ There is therefore a need for the subject of the waste lands to be reclaimed by historians, to ensure that the generalizations which are made about the financing of enclosures are not unduly weighted by the research bias towards the open fields.

This paper is concerned with the subject of waste-land enclosure costs. It will be

demonstrated that, contrary to the assumption amongst modern agricultural historians that land sales were of little significance as a way of financing enclosures until the nineteenth century, in North Somerset at least the method was well established by the 1770's. Ample evidence of this claim can be extracted from the enclosure awards which reveal details of both the financial and economic costs imposed by this method. The paper examines, first, the financing of the North Somerset enclosures, and second, the relationship between this evidence and that which is generally available on the subject. By emphasizing the economic aspects of the enclosure of the waste lands it is intended that this study should offer a corrective to both the traditional concern of historians with the arable open fields, and that of geographers with physical change.

II

Our initial concern is with the parliamentary enclosure of some 42,000 acres of waste land in the northern third of the historic county of Somerset, stretching from the southern slopes of the Mendip Hills northwards to the River Avon. Within this region there were three quite different farming areas. First there were the uplands, chiefly the carboniferous limestone Mendips and its outliers but including also the southerly extensions of the oolitic limestone Cotswolds, for example Dundry Hill south of Bristol. Second, there was the northern extension of the central Somerset

¹This article draws substantially on chapters 2 and 3 of B J Buchanan, 'Capital Formation in North Somerset, 1750–1830', thesis submitted to the University of Bristol, 1979. I would like to thank Professor W Ashworth and Dr C G A Clay for their helpful comments and advice. I am also grateful for the help received from Mr D M M Shorrocks of the Somerset Record Office (SRO) and Miss M E Williams of the Bristol Archive Office (BAO) and their colleagues.

²The case for the inclusion of the waste lands was made by E K C Gonner, *Common Land and Inclosure*, 1912, pp 192–4, but they have been excluded by more recent scholars, for example D N McCloskey, 'The Enclosure of Open Fields . . .', *Jnl Econ Hist*, XXXII, 1972, pp 15–35.

³For example Michael Williams, 'The Enclosure of Waste Land in Somerset, 1700–1900', *Trans Inst Brit Geogs*, LVII, 1972, pp 99–123, and John Chapman, 'Parliamentary Enclosure in the Uplands: the Case of the North York Moors', *Ag Hist Rev*, XXIV, 1976, pp 1–17.

Levels, low-lying and frequently flooded peat bogs and alluvial lands that skirted much of the coast from the mouths of the Rivers Axe to Avon and lay inland by the river valleys. Third, there was the rest of North Somerset, undulating lands between the northern slopes of the Mendips and the River Avon, made up largely of fertile red marls and sandstones. By the mid-eighteenth century this last area was already long enclosed and attuned to the market economy provided by the growing city and port of Bristol and the seasonal influx of visitors to Bath.⁴ It was therefore the under-utilized potential of the uplands and low moorlands, offering common sheep pasture and cattle grazing respectively, that excited interest in the second half of the eighteenth century.

The impulse to enclose, of course, was felt widely at this time, but whereas in many counties the wastes remained common grazing ground until pressures were further intensified in the French Wars,⁵ in North Somerset these were with some small exceptions the only areas still to be enclosed. It was to them, therefore, that attention was turned, first to the Mendips from the 1770's and then to the Levels, with interest in the latter increasing from the 1790's. The reasons for these differences in timing can be suggested only briefly, but it seems likely that the enclosure of the uplands began early in response to wheat prices which fluctuated upwards from the 1750's because these lighter soils could be more easily adapted to tillage than the richer but heavier soils of the wet grasslands. The incentive to enclose the latter came with the significant rise in meat prices during the war years.⁶ These stimulated a change in the organization of land-holding in the Levels, if not in land use.

Evidence of the financing of North Somerset enclosures did not at first seem promising. Commissioners' accounts are rare, thus ruling out the possibility of a study of costs like that conducted so comprehensively for Warwickshire, and very little extra-award material has been found, unlike that discovered for Buckinghamshire.⁷ However, a close study of the surviving awards for the period housed in the Somerset Record Office has revealed that, in the absence of financial details of a more orthodox nature, there is nevertheless an alternative source of information which can be used to the same end. This indirect evidence is to be found amongst the profusion of organizational details in the awards, for these frequently record both the amount of land sold to finance the enclosure and the capital sum thus raised. It may seem a kind of legerdemain to transmute this land transaction into the total public cost of the enclosure in question, but the commissioners were instructed by the relevant Acts of Parliament to sell such proportion of the land to be enclosed as they judged would enable them to cover the cost of the undertaking, and the details in the awards indicate that they did so. Corroborative evidence comes from the only award accompanied by a set of commissioners' accounts, for the sum realized by the sale of land as recorded in the former tallies exactly with the total cost of the enclosure as accounted for in the latter.⁸

It is this practice of land sale which makes the North Somerset evidence on financing markedly different from that of other areas studied intensively, though this is probably only a reflection of the former concentration on the open-field counties

⁴W E Tate, *Somerset Enclosure Acts and Awards*, 1948, pp 13-25; Peter Mathias, *The First Industrial Nation*, 1969, pp 92-3.

⁵Michael Turner, *English Parliamentary Enclosure, its Historical Geography and Economic History*, Folkestone, 1980, pp 86-93.

⁶J D Chambers and G E Mingay, *The Agricultural Revolution 1750-1880*, 1966, pp 83, 110.

⁷J M Martin, 'The Cost of Parliamentary Enclosure in Warwickshire' in E L Jones (ed), *Agriculture and Economic Growth in England, 1650-1815*, 1967, pp 128-51. M E Turner, 'Some Social and Economic Considerations of Parliamentary Enclosure in Buckinghamshire, 1738-1865', PhD thesis, University of Sheffield, 1973, and 'The Cost of Parliamentary Enclosure in Buckinghamshire', *Ag Hist Rev*, XXI, 1973, pp 35-46.

⁸SRO, Shiphham and Winscombe Enclosure Award, Q/RDe 13, 1797-99.

already observed. Indeed, the method was frequently remarked upon by earlier writers who had a wide if generalized familiarity with enclosure practices,⁹ although it has been questioned on the basis of more recent scholarship. Thus M E Turner has written that the belief that enclosures were ever widely financed by land sales '... was an erroneous view but one which has been repeated often. It was only during the nineteenth century that land deductions and sales became prevalent. Formerly it was strictly applied to certain charity lands and then only in specific cases.'¹⁰ However, of the 41 parliamentary enclosures in North Somerset between 1770 and 1830 for which awards survive, 37 were financed by the sale of land and only four by the levying of a rate. This difference would be of a positive but limited interest were it not for the possibly different effect of each method on enclosure costs. It has hitherto been assumed that the costs of waste land enclosure were high because of the physical problems associated with the difficult terrain, but a consideration of the practice of raising capital sums by land sale does prompt the suggestion that procedural or administrative factors in these areas may have been as important as the topographical ones.

In North Somerset the land was sold at public auction after due notice in the parish church and in local newspapers. The auctions took place after the commissioners had had time to perambulate the land, assessing its quality and situation on the advice of a surveyor, and they were held at some convenient inn. Meanwhile, a mortgage was arranged, thus allowing work to begin.¹¹ Decisions about the amount to be

auctioned were matters for fine judgement, complicated by two sets of problems.

First, the commissioners had to estimate the internal costs, and here there was an element of uncertainty because of the need for construction works such as drainage channels. However, unexpected and escalating costs could be met by further land sales, of which there is evidence in both the awards and the limited supplementary evidence.¹² As an insurance against such delays the experienced commissioners may have over-estimated the initial acreage to be sold, especially as the legal clause directing the expenditure of any surplus monies on lasting improvements relieved them of the task of dividing this amongst the proprietors. Second, the commissioners had to assess the external factors affecting the value of land, and again they sometimes misjudged the situation, the unexpectedly high prices realized at some auctions providing them with more abundant funds than anticipated. When this happened at the Weston-super-Mare enclosure the proprietors requested that the surplus be spent on further improvements to walls, banks and roads.¹³

The possible significance of these administrative factors will now be seen. Balanced as they were on the twin uncertainties of internal costs and external values, land sales could tend to result in larger sums of capital being raised with greater ease and, therefore, lead to more costly enclosures, than the method of financing by the imposition of a rate, often grudgingly paid under threat of distraint, which could therefore tend to result in cheaper enclosures.

commons to be enclosed was executed to the Rev Henry Harris and £800 was '... paid into the hands of Mr Robert Wright [a commissioner] who is hereby appointed Treasurer'.

¹²For example, SRO, DD/FS, Box 67, FL 'Bleadon Inclosure 1788'. Two sales were held in 1788, but when in June 1789 it was found '... necessary to raise more money for finishing the several works made and to be made in the Inclosure ...', a third auction was ordered.

¹³SRO, DD/BK, Correspondence and Papers; Weston-super-Mare Public Ref Lib, LOO/53, S/W17/43, 'Commissioner's Proceedings', 'Commissioner's Accounts' and Sales Bills.

⁹Lord Ernle, *English Farming Past and Present*, 6th edn, 1961, p 251; Gonner, *op cit.* p 90; W H R Curtler, *The Enclosure and Redistribution of our Land*, Oxford, 1920, p 166.

¹⁰Turner, thesis, p 326.

¹¹For example, SRO, Wookey Enclosure Award Q/RDe 134, 1782-86 and SRO, DD/S/CX, 'Proceedings of the Commissioners' 1782-87. In September 1782 a mortgage of the moors and

Evidence on the financing of enclosures in this region has been assembled in Table 1, where columns I to IV display information established from the awards. Although of interest because of their bearing on costs, additional details relating for example to the allotments made are omitted on this occasion because attention is here directed to the acreage sold (column III) and the capital sum thus raised (column IV). The figures in column IV are taken in this study to constitute the total public costs of the enclosures listed. Historic prices are given throughout.

The contents of the last three columns of Table 1 are derived from the information in the first four. Financial costs per acre are shown in column V. The three enclosures of the 1770's for which figures are available support the suggestion that the levying of a rate tended to keep down costs (Doulting and Stoke St Michael, 1775-76, 23.0s per acre) whilst land sales led to higher costs (Compton Bishop, 1777-79, 61.5s per acre, and Brislington, 1778-80, 58.5s per acre), for each case involved the physical problems associated with the waste lands, although these varied for individual enclosures, as did other factors such as acreage. In the only other rate-financed enclosure for which costs are available (Portishead and Weston-in-Gordano, 1807-09), severe administrative problems arose from the need to sort out two inter-mixed parishes, and it may have been this complication which over-ruled the contrast with contemporary cases financed by land sale.

Although land sales meant that proprietors had to meet no direct financial obligations, they did have to face a very real cost in terms of the reduction in the amount of land allotted, and the loss of the future stream of income they would otherwise have received.¹⁴ I propose to call this

the economic cost and to measure it by the percentage of land sold. It is shown in column VII. These financial and economic costs rarely bore with equal severity on the same parish. For example, at Locking (1800-01) the financial cost averaged nearly £10 per acre but the real economic cost in terms of land and income foregone was less than 20 per cent, whilst at Shiphham and Winscombe (1797-99) the financial cost was less than £3 per acre but each proprietor lost over half the land to which he was otherwise entitled.

An intriguing aspect of this relationship was the selling price of land, for this influenced both the financial and economic costs. It is shown in column VI. Although a high selling price did not necessarily lead to a reduction in the financial cost of enclosure, it was generally associated with a reduction in the economic cost. This inverse relationship between the auction price of land and the percentage sold is shown in Table 2 where the enclosures for which this evidence is available are ranked according to the former. With some exceptions (such as early enclosures where favourable circumstances led to a high selling price for land), there was a decline over time in the economic cost, which may indicate that in general land values rose faster than the financial costs of enclosure. However, it must be observed that there was here no simple chronological escalation of financial costs in the manner which is usually accounted for elsewhere in terms of war-time inflation and the leaving till last of the more complicated and so more costly cases.

The complexity of the chronological problem may be summarized thus: 2 enclosures with Acts as widely separate as 1775 and 1795 cost below £2 per acre; 8 with Acts from 1778 to 1801 came in the £2 to £3 bracket; 9 with Acts between 1777 and 1809 cost between £3 and £4; 12 with Acts spreading from 1788 to the end of the period cost more than £4 per acre. Some

¹⁴BAO, 01097(s)g, letter of December 1809. The Portbury commoners were aware of this cost and complained that the commissioners had sold 102 acres of the best land, '... leaving only 156 to be divided'.

clues to these widespread variations over time are provided by the various factors which exerted a probable influence on the selling price of land and so indirectly on financial costs. As shown in Table 2 these influences ranged from the possibility of extra-agricultural use (eg as building land) to the changing value of land in relation to its own agricultural possibilities and the prices of arable and animal husbandry products mentioned earlier.

The summarizing of these factors promotes the suggestion that there was at this time not one but several land markets, each with its prevailing values. The force of this point is somewhat obscured in Table 2 because the evidence there relates to the average price at which land was sold, that being for many enclosures the best information which is available. However, the position is clarified in Table 3, which is based on the further analysis of those awards which are sufficiently detailed to allow selling prices to be attributed to different types of land, and those in which only one category of land was offered for sale in any case. This evidence shows that within each land market selling prices moved in distinct but separate patterns, so that whilst, for example, the price of the low moorland acres rose steadily until the early 1790's, when a plateau was reached which continued until the last of the lowlands for which this information is available had been enclosed, the much more modest selling prices of the Mendip uplands moved generally though erratically upwards until the second half of the 1790's, before falling away thereafter.

Conclusions on such a subject are hazardous, but within the context of enclosures made costly by the land sale method of raising capital and by the technical and topographical problems of the waste lands, it was perhaps the operation of these separate land markets which stimulated the puzzling variations in financial costs per acre. Lastly, it may have been because

some of the earlier enclosures for these reasons were made more costly than would otherwise have been the case, and some of the later ones rendered less costly, that the general inflation associated with the years of the French Revolutionary and Napoleonic Wars did not in this region (from the evidence based on the awards) result in the large increases in costs relative to earlier years that were more generally the case.

The pursuit of this line of enquiry invests the purchasers of land with a special importance, for their judgement was crucial to the determination of prices within the different markets. From the awards it is possible to make three generalizations. Firstly, most of the land auctioned was bought by those already living in the region, though not necessarily involved in the enclosure in question, nor even living in the same parish. The exceptions to this generalization were mostly from Bristol,¹⁵ but on the whole there was a lack of involvement by its citizens which is surprising in view of the speculations in canal and house building.¹⁶ However, it is probably an indication that the Bristol merchant interest in North Somerset of the earlier decades of the eighteenth century had been exhausted.¹⁷

Secondly, a classification of the purchasers of land has shown that although the gentry predominated there was considerable buying by yeomen farmers, as well as by other country dwellers who had a less personal link with farming.¹⁸ These included local clergymen, doctors, lawyers, and rural tradesmen, who all bought land at the sales. Thirdly, the purchasers occasionally included the enclosure commissioners themselves, for until the turn of the century (41 Geo III c 101) an involvement

¹⁵For example, SRO, Clevedon Enclosure Award, Q/RDe 78, 1799-1801. Land was bought for £918 by a Bristol butcher, with a grazier as trustee.

¹⁶J R Ward, *The Finance of Canal Building in Eighteenth-Century England*, Oxford, 1974, pp 138-40, and 'Speculative Building at Bristol and Clifton, 1783-1793', *Bus Hist*, xx, 1978, pp 3-18.

¹⁷Buchanan, thesis, pp 258-366.

¹⁸Ibid, pp 53-7, Table 2(s).

with the executive aspects of the undertaking was not a barrier to the purchase of land, even within the enclosure concerned.¹⁹

The rural base of most purchasers, their status as gentry and farmers, and in several cases their experience of the business of enclosure, together with the general absence of urban speculators, all imply a considerable degree of familiarity with the practice of farming in the region. It is likely, therefore, that the prospective buyers made their bids in the light of an awareness of the agricultural possibilities of the land on offer. This suggests that, despite a current value influenced by the pressing demand for food and the high commodity prices and therefore high rents resulting from this, the land was marginal only in the sense of being the next unit available for cultivation should the cost of bringing it into production be balanced by the revenue it could then produce, and not in the sense of being inherently poor agricultural land. Indeed, in the case of Mendip it was possibly an earlier pre-emption for the production of wool for the local textile industry and for the mining of lead and calamine, all in decline by the mid-eighteenth century, which had restricted it to an agricultural use below its potential.²⁰

III

The enclosure costs for North Somerset will now be compared with the general evidence compiled by B A Holderness, about which this author has concluded that although his tables are provisional '... it is unlikely that further research will modify the trends they reveal very significantly'.²¹

¹⁹See the following awards: SRO, West Harptree, Q/RDe 18, 1787-90; Wells (East Horrington and Chilcot), Q/RDe 73, 1792-94; Wells (St Cuthbert), Q/RDe 81, 1793-95; Shipham and Winscombe, Q/RDe 13, 1797-99.

²⁰J D Hanwell, 'Agriculture on Mendip' in W G Hall (ed), *Man and the Mendips*, Mendip Society, Frome, 1971, pp 78-9.

²¹B A Holderness, 'Capital Formation in Agriculture' in J P P Higgins and Sidney Pollard (eds), *Aspects of Capital Investment in Great Britain 1750-1850*, 1971, pp 162-70.

It may be seen from Table 4 that average costs in North Somerset, as anticipated, were considerably greater than for the rate-financed parliamentary enclosures (column 1). They were however unexpectedly less than for the waste lands in general (column 4), especially in the significant period 1793 to 1815, and when grouped by the year of the act. It is the reason for this anomaly which will now be pursued, but first a comment must be made about the difference between the North Somerset waste land costs and those for the open fields.

This observation is that the contrast in costs persisted despite certain heavy expenditures which were more likely to be encountered in the open fields than the waste lands. Firstly, the fencing of the tithe owner's allotment could be a very important item in open-field enclosures, amounting in some cases to one-third of the total, but this charge is almost entirely absent from the North Somerset awards.²² Secondly, a cost of open-field enclosure which has no parallel in the North Somerset wastes was the spending on grass seeds, which could be more than 20 per cent of public costs in the earlier decades, though falling away thereafter.²³ Thirdly, expenditure on road making in open-field enclosure was considerable from the 1790's and could amount to between 20 and 30 per cent of costs.²⁴ Again, there is little comparable evidence in the North Somerset awards, some of which even declared no public roads to be necessary (contrary to the general assumption that they would be most needed where waste land was reclaimed). This was the case with seven enclosure awards between 1791 and 1809 when such costs were particularly high in open-field enclosure.²⁵

²²Martin, *op cit*, pp 148-51, Appendix B.

²³Turner, thesis, pp 322-4, Appendix IX(b).

²⁴*Ibid*, pp 322-4. Also, Martin, *op cit*, p 137.

²⁵Public roads were declared unnecessary at Westbury, 1788-91; Bleadon 1788-91; Banwell, 1795-97; Locking, 1800-01; Tick-enham, 1801-03; Worle, 1801-03; Portishead and Weston-in-Gordano, 1807-09.

This difficulty in classifying costs suggests that the polarization between open field and waste land is misleading, and that enclosures may be more instructively viewed as a re-organization of land holding within a wide range of topographical, economic and social conditions. Such an approach may provide a clue to the anomaly mentioned previously, namely the unexpected difference between the average costs of North Somerset enclosures and those of the waste lands in general. If it is assumed that all waste land costs were likely to be similar for topographical and administrative reasons, then this is difficult to explain. But if these were part of a range of conditions and expenditures then it may be that the general waste land costs were heavier than those for North Somerset because of some special difference of circumstance. In particular it may be that whilst the former were increased by the inclusion of reclamation schemes, such as that undertaken in the East, West and Wildmore Fens by John Rennie in the early nineteenth century at a cost of £10 per acre,²⁶ the latter were primarily for the purpose of enclosure, the task of major reclamation being undertaken separately.

This suggestion will now be tested in two stages. First, the expenditure on capital improvements in North Somerset enclosures (ie surveying and construction costs) will be compared with the general evidence, in order to check that the lower overall costs of the former did not mask an investment in capital works as great as that in the waste lands generally. Second, the three comprehensive drainage schemes in the region will be examined to determine their relation to the enclosure schemes upon which they followed.

The rarity of commissioners' accounts in North Somerset means that there is unfortunately little information on the first

matter, but what is available on the distribution of costs within enclosure has been analysed, and that which relates to capital improvements has been set out in Table 5. It must be admitted that this evidence is both too limited (the three enclosures) and too general (that based on John Billingsley), but it does relate to the critical years 1793 to 1815, and it has a certain internal consistency. Thus, in both the upland enclosure at Shipham and Winscombe and the lowland one at Congresbury the construction costs represent about 44 per cent of the public expenditure, and although the proportion was more nearly 59 per cent at Weston-super-Mare, where investment in terms of shillings per acre was also higher, it may be recalled that extra works were undertaken here because unexpectedly high capital sums had been raised. In the general evidence from Billingsley the improvement costs were of a similar order to those in the three specific cases in financial terms, though representing a higher proportion of total costs. But this may simply indicate that, with his first-hand experience of enclosures, Billingsley was able to prevent the escape of certain improvement costs to other categories.²⁷ Unfortunately, in the Shipham and Winscombe enclosure the surveyor's attendance at meetings, though not his field work, was irretrievably accounted for amongst the administrative costs.

A comparison of this evidence with that compiled by Holderness²⁸ suggests that in waste land enclosures generally the investment in capital improvements was twice as great as in North Somerset. Between 1793 and 1801 when the improvement costs for the waste lands in general averaged 66.0s

²⁷John Billingsley (1747-1811) served as commissioner in the following enclosures: West Harptree, 1787-90; Rode and Wingfield, 1790-92; Rodney Stoke, 1791-93; Croscombe and Dinder, 1792-93; Wells (East Horrington and Chilcot), 1792-94; Wells (St Cuthbert), 1793-95; East Harptree, 1794-96; Cheddar, 1795-1801; Cheddar, Priddy and Rodney Stoke, 1811 until his death. He was the author of the *General View of the Agriculture of the County of Somerset, drawn up in the year 1795*, Bath, 1797.

²⁸Holderness, op cit, p 169, Table 3B.

²⁶Holderness, op cit, pp 167-8.

per acre, the North Somerset evidence suggests costs of about 33.0s per acre. For the years 1802 to 1815 the figures were respectively 100.1s per acre and 57.3s per acre, and for the succeeding years they were 76.0s per acre and 32.0s per acre. Despite the very considerable limitations of this comparative evidence, the gap between this investment in the waste lands in general and those in North Somerset is here shown to be so great as to make it unlikely that the large-scale reclamations of the former could have been undertaken within the much lower improvement costs of the latter.

Before considering the role of the drainage schemes it is of interest to refer briefly to those construction works which were undertaken within enclosures. In Table 5 these are arranged under such heads as roads, fences and drainage ditches, but this neat classification belies the great range of provisions revealed by the descriptive evidence in the awards. The setting out of public roads was always a first task, but as already noted these were sometimes found unnecessary. The provision of fencing also varied greatly. Its importance was lessened in the lowlands because the essential drainage ditches could there function as boundaries, thus constituting a reduction in cost. And just as most drainage works were financed from within the undertakings, so until the turn of the century and particularly within the Mendip enclosures it was not uncommon for the fencing of individual allotments to be covered by public costs, though not the subdivisions within farms. After the turn of the century this was less likely, but the outer boundaries (subject to negotiation with adjoining parishes), the public roads, and the land to be sold, were all still likely to be fenced. The allotments relating to special rights, for example those made frequently in lieu of the lord's right of soil, or occasionally in respect of common rights attached to glebe land, or very rarely in lieu of tithes, were

all awarded after the sale of land. Even when fenced as a public cost, therefore, they still bore the economic cost of enclosure. But the fact that in all cases these varied and important construction works were limited to the individual enclosures, suggests that the primary purpose was land reorganization and not comprehensive reclamation. The function of the large drainage undertakings in the lowlands must therefore now be considered.

The general powers of the Commissions of Sewers to seek the control of floodwaters in the Levels were long established.²⁹ But from the later decades of the eighteenth century they were being urged by the agricultural interest to embark upon ambitious new schemes for whole catchment areas, and this they were unwilling to do. Their caution arose essentially from the fear of jeopardizing their personal finances by initiating works towards which those benefiting had no obligations established by traditions of tenure.³⁰ The proprietors were therefore obliged to obtain parliamentary authorization for the improvements they sought, a step which led to the appointment of a body of commissioners with the power to execute certain capital works, financed by the levying of a rate. As with the drainage aspects of enclosure, the administration of the completed works reverted to the Commissioners of Sewers.

The financial aspects of the drainage schemes have been analysed in detail elsewhere, and for present purposes it is only possible to state briefly that in the Axe Drainage (1802-10) the average cost was 80.5s per acre, of which capital improve-

²⁹Sidney and Beatrice Webb, *Statutory Authorities for Special Purposes*, 1922, reprinted 1963, pp 39-45. Their warning that 'this is the most obscure corner in the whole of English Local Government' is still relevant despite the work of Michael Williams, *The Draining of the Somerset Levels*, Cambridge, 1970, for in this the focus of attention is the landscape and not administration and finance.

³⁰SRO, D/RA SW11, 'Proceedings of the Commissioners of Sewers in the business of the Congresbury Drainage' 1811-12, and the 'Case for the opinion of Consr Moore' 30 June 1812, and 18 November 1812.

ments accounted for 65.4s per acre, whilst in the Weston Drainage (1810–15) the figures were respectively 113.3s and 61.5s per acre. In the Congresbury Drainage (1819–26) they were 93.7s and 69.9s per acre.³¹

It cannot be claimed that the same lowland acres were necessarily subject to both parliamentary enclosure and parliamentary drainage schemes, but the overlap was sufficiently great to bestow significance upon an exercise whereby the costs sustained in those parishes which were previously the subject of an enclosure award are related to the costs of the subsequent drainage scheme. For example, in the six parishes enclosed between 1777 and 1801 which later formed part of the Axe Drainage scheme of 1802–10, the combined cost of enclosure (averaging 69.7s per acre) and drainage (80.5s per acre) was 150.2s per acre. This figure for the separate but related processes is comparable to that for the waste lands in general where such works were undertaken jointly at an average cost of 110.0s per acre in the years 1793 to 1801, and 150.0s per acre in the years 1802 to 1815 (Table 4).

The complementary relationship between lowland enclosure and drainage in North Somerset can be examined in greater detail and in terms of capital improvements in one instance, and then only because of the rare survival of the extra-award documents of the Congresbury, Week St Lawrence and Puxton enclosure of 1809–16 which preceded the Congresbury Drainage scheme of 1819–26. The overlap applied to about one-third of the acreage drained; to the personnel, for Young Sturge acted as commissioner for the enclo-

sure and surveyor to both undertakings;³² and to the basic engineering concept, for when John Rennie drew up his drainage plans the proposed new cut from the sea back into the moors linked up with channels dug during the recently completed enclosure.³³

This close constructional relationship was reflected in the financial aspects of the schemes, which provide specific evidence of the general case being made. Thus, in terms of the investment in capital improvements the Congresbury enclosure (32.0s per acre, Table 5) and drainage (69.9s per acre, see above) costs at 101.9s per acre were very close to the putative capital costs of 100.1s per acre for the years 1802–15 for the waste lands generally (see above) though greater than the 76.0s per acre for the years from 1816 when the large reclamations may have been completed.

The conclusion to this analysis is that whilst the average costs of North Somerset enclosures were significantly greater than those for open-field enclosure, they were less than for the waste lands generally because the extensive drainage provisions which commonly featured as an enclosure cost in the latter were to be found in North Somerset as a post-enclosure cost. The Congresbury Enclosure and Drainage schemes offer the most detailed evidence of the close relationship between the two.

Viewed in this perspective the North Somerset enclosures were an organizational preliminary to that further investment in drainage, soil reclamation and farm creation which was essential if the upland and lowland wastes were to be converted into productive farms. But contemporary evidence on rents suggests that because this subsequent and cumulative investment was needed to consolidate the initial capital input through enclosure, the

³¹Buchanan, thesis, pp 98–132 and Tables 3(3) to 3(10). Capital improvement costs here cover those expenditures crucial to the new works: surveying, construction, land purchases, and damages. The last two items were relatively unimportant in the Axe and Congresbury schemes (averaging 9.0s per acre), but more important in the Weston scheme (40.0s per acre) because of the complication presented by a tide mill.

³²Young Sturge was a commissioner in the following enclosures: Portishead, 1807–09; Congresbury, 1809–16; Wraxall, 1813–19; Long Ashton, 1813–20; Uphill, 1813–18; and in the Weston Drainage scheme, 1810–15.

³³SRO, Congresbury Drainage Award, Q/RDe 1:9.

rates of return in the waste lands were not as high as in the already established agricultural areas where they were less likely to be eroded by such heavy post-enclosure costs.

IV

It is possible the close attention to documentary evidence may place this study amongst those referred to pejoratively as 'antiquarian' and 'source-orientated', but these regional roots provide an informed base from which to probe the accepted notions on the subject, identifying certain problems which the generalizations obscure.

First, there is the question of the way in which enclosures were financed. It has been demonstrated that, contrary to the current view, capital sums were raised by land sale from at least the 1770's. The lack of evidence for the use of this method in other waste land regions may indicate only that this information has not previously been thought relevant, rather than that it does not exist. For example, although land sales were authorized in each of the enclosure acts of the eighteenth century described in detail by the Hammonds in *The Village Labourer*,³⁴ no subsequent study has remarked on this fact, even though that for Holland Fen (1767, 22,000 acres) was in an area which has since inspired much research.³⁵ But the question of how widely this method was employed is an important one, both in the context of the individual enclosures, for it freed the commissioners from the constraints of rate finance, and in that of the subject as a whole, for about one-third of all enclosure was of the com-

mons and wastes.³⁶ Clearly more evidence is needed, and if a distinction could be made between land sales as a valid alternative to rate finance, and land deductions as only one of several ways of meeting the rate, then the subject could be placed upon a much firmer analytical foundation.³⁷

Second, there is the matter of the influences upon the cost of enclosure. These are usually discussed in terms of the physical problems and the claims to land, but the recognition of the importance of certain administrative procedures and of the land sales to which they gave rise, places the subject in a new perspective by shifting the focus from the endogenously determined demand for capital to the question of its supply. Not only did this resort to the land market affect the magnitude of the capital sum available, it also introduced an element of personal judgement into the business of enclosure (whether through the commissioners' decisions about the amount of land to be sold or the purchasers' decisions about the price of land to be bought) and so allowed a note of unpredictability to enter into the financial and economic costs and their variations over time.

Third, there is the problem of classification. Ambiguities arise at several levels, and in so far as such evidence is used as a basis for generalization or aggregation they are a serious matter. It is probable that much construction work financed by surplus funds within the North Somerset enclosures, or as part of large-scale reclamation within the waste lands generally, should be more properly regarded as an investment consequent upon enclosure than a cost of enclosure itself. Such distinctions are difficult to establish within the

³⁴J L and Barbara Hammond, *The Village Labourer 1760-1832*, 1920, pp 309-30. John Chapman has recently drawn attention to the re-distributive aspect of land sales, 'Land purchasers at enclosure: evidence from West Sussex', *Local Historian*, XII, 1977, pp 337-41, but without reference to the capital sums raised or the dates of the enclosures.

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³⁶Turner, *op cit*, 1980, pp 69-71, Table 11. 27.7 per cent of all parliamentary enclosure before 1793 was of commons and waste and 31.3 per cent of all that between 1793 and 1815.

³⁷Since completing this article I have been able to read Dr Turner's forthcoming study, 'Cost, Finance and Parliamentary Enclosure', to be published in the *Econ Hist Rev*. I am most grateful to him for this opportunity.

This difficulty in classifying costs suggests that the polarization between open field and waste land is misleading, and that enclosures may be more instructively viewed as a re-organization of land holding within a wide range of topographical, economic and social conditions. Such an approach may provide a clue to the anomaly mentioned previously, namely the unexpected difference between the average costs of North Somerset enclosures and those of the waste lands in general. If it is assumed that all waste land costs were likely to be similar for topographical and administrative reasons, then this is difficult to explain. But if these were part of a range of conditions and expenditures then it may be that the general waste land costs were heavier than those for North Somerset because of some special difference of circumstance. In particular it may be that whilst the former were increased by the inclusion of reclamation schemes, such as that undertaken in the East, West and Wildmore Fens by John Rennie in the early nineteenth century at a cost of £10 per acre,²⁶ the latter were primarily for the purpose of enclosure, the task of major reclamation being undertaken separately.

This suggestion will now be tested in two stages. First, the expenditure on capital improvements in North Somerset enclosures (ie surveying and construction costs) will be compared with the general evidence, in order to check that the lower overall costs of the former did not mask an investment in capital works as great as that in the waste lands generally. Second, the three comprehensive drainage schemes in the region will be examined to determine their relation to the enclosure schemes upon which they followed.

The rarity of commissioners' accounts in North Somerset means that there is unfortunately little information on the first

matter, but what is available on the distribution of costs within enclosure has been analysed, and that which relates to capital improvements has been set out in Table 5. It must be admitted that this evidence is both too limited (the three enclosures) and too general (that based on John Billingsley), but it does relate to the critical years 1793 to 1815, and it has a certain internal consistency. Thus, in both the upland enclosure at Shipham and Winscombe and the lowland one at Congresbury the construction costs represent about 44 per cent of the public expenditure, and although the proportion was more nearly 59 per cent at Weston-super-Mare, where investment in terms of shillings per acre was also higher, it may be recalled that extra works were undertaken here because unexpectedly high capital sums had been raised. In the general evidence from Billingsley the improvement costs were of a similar order to those in the three specific cases in financial terms, though representing a higher proportion of total costs. But this may simply indicate that, with his first-hand experience of enclosures, Billingsley was able to prevent the escape of certain improvement costs to other categories.²⁷ Unfortunately, in the Shipham and Winscombe enclosure the surveyor's attendance at meetings, though not his field work, was irretrievably accounted for amongst the administrative costs.

A comparison of this evidence with that compiled by Holderness²⁸ suggests that in waste land enclosures generally the investment in capital improvements was twice as great as in North Somerset. Between 1793 and 1801 when the improvement costs for the waste lands in general averaged 66.0s

²⁷John Billingsley (1747-1811) served as commissioner in the following enclosures: West Harptree, 1787-90; Rode and Wingfield, 1790-92; Rodney Stoke, 1791-93; Croscombe and Dinder, 1792-93; Wells (East Horrington and Chilcot), 1792-94; Wells (St Cuthbert), 1793-95; East Harptree, 1794-96; Cheddar, 1795-1801; Cheddar, Priddy and Rodney Stoke, 1811 until his death. He was the author of the *General View of the Agriculture of the County of Somerset, drawn up in the year 1795*, Bath, 1797.

²⁸Holderness, op cit, p 169, Table 3B.

²⁶Holderness, op cit, pp 167-8.

per acre, the North Somerset evidence suggests costs of about 33.0s per acre. For the years 1802 to 1815 the figures were respectively 100.1s per acre and 57.3s per acre, and for the succeeding years they were 76.0s per acre and 32.0s per acre. Despite the very considerable limitations of this comparative evidence, the gap between this investment in the waste lands in general and those in North Somerset is here shown to be so great as to make it unlikely that the large-scale reclamations of the former could have been undertaken within the much lower improvement costs of the latter.

Before considering the role of the drainage schemes it is of interest to refer briefly to those construction works which were undertaken within enclosures. In Table 5 these are arranged under such heads as roads, fences and drainage ditches, but this neat classification belies the great range of provisions revealed by the descriptive evidence in the awards. The setting out of public roads was always a first task, but as already noted these were sometimes found unnecessary. The provision of fencing also varied greatly. Its importance was lessened in the lowlands because the essential drainage ditches could there function as boundaries, thus constituting a reduction in cost. And just as most drainage works were financed from within the undertakings, so until the turn of the century and particularly within the Mendip enclosures it was not uncommon for the fencing of individual allotments to be covered by public costs, though not the subdivisions within farms. After the turn of the century this was less likely, but the outer boundaries (subject to negotiation with adjoining parishes), the public roads, and the land to be sold, were all still likely to be fenced. The allotments relating to special rights, for example those made frequently in lieu of the lord's right of soil, or occasionally in respect of common rights attached to glebe land, or very rarely in lieu of tithes, were

all awarded after the sale of land. Even when fenced as a public cost, therefore, they still bore the economic cost of enclosure. But the fact that in all cases these varied and important construction works were limited to the individual enclosures, suggests that the primary purpose was land reorganization and not comprehensive reclamation. The function of the large drainage undertakings in the lowlands must therefore now be considered.

The general powers of the Commissions of Sewers to seek the control of floodwaters in the Levels were long established.²⁹ But from the later decades of the eighteenth century they were being urged by the agricultural interest to embark upon ambitious new schemes for whole catchment areas, and this they were unwilling to do. Their caution arose essentially from the fear of jeopardizing their personal finances by initiating works towards which those benefiting had no obligations established by traditions of tenure.³⁰ The proprietors were therefore obliged to obtain parliamentary authorization for the improvements they sought, a step which led to the appointment of a body of commissioners with the power to execute certain capital works, financed by the levying of a rate. As with the drainage aspects of enclosure, the administration of the completed works reverted to the Commissioners of Sewers.

The financial aspects of the drainage schemes have been analysed in detail elsewhere, and for present purposes it is only possible to state briefly that in the Axe Drainage (1802–10) the average cost was 80.5s per acre, of which capital improve-

²⁹Sidney and Beatrice Webb, *Statutory Authorities for Special Purposes*, 1922, reprinted 1963, pp 39–45. Their warning that 'this is the most obscure corner in the whole of English Local Government' is still relevant despite the work of Michael Williams, *The Draining of the Somerset Levels*, Cambridge, 1970, for in this the focus of attention is the landscape and not administration and finance.

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³³SRO, Congresbury Drainage Award, Q/RDe 139.

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overall sum recorded as that raised to finance the undertaking, but the identification of this problem, and of others raised here, shows the importance of regional evidence. It is thus as both a significant part of the general subject in its

own right and as a corrective to the traditional emphasis on the open fields, that waste land enclosures in their financial aspects constitute an important but neglected area of research.

TABLE I
Parliamentary Enclosure in North Somerset, 1770-1830

SRO Q/RDe	Parish	Act — Award	I Acreage enclosed	II Common Land			III Land Sold Acres	IV Cost of Enclosure £	V Financial Cost per Acre shillings	VI Selling Price of Land Per Acre shillings	VII Econon Cost.P centag Sold
				Lowland Waste	Upland Waste	Open Fields					
—	Cranmore	1770	(400) ¹		Mendip						
62	Ubley	1771-73	902		Mendip		164				18.2
58	Doulting and Stoke St Michael	1775-76	1,200		Mendip		Rate Levied	1,382	23.0		
117	Compton Bishop	1777-79	275	Moors			28	845	61.5	603.6	10.2
130	Brislington	1778-80	400		Brislington Common		20	1,170	58.5	1,170.0	5.0
27	Shepton Mallet	1782-85	724		Mendip		Rate Levied				
134	Wookey	1782-86	1,193	Moors	Mendip		411	4,338	72.7	211.1	34.5
132	Blagdon	1784-87	967		Mendip		283	2,061	42.6	145.7	29.3
18	West Harptree	1787-90	857		Mendip		438	2,703	63.1	123.4	51.1
22	Bleadon	1788-91	1,194	Moors	Mendip		243	5,955	99.7	490.1	20.4
71	Compton Martin	1788-91	[664]		Mendip		372	[2,232]	67.2	120.0	56.0
21	Westbury	1788-91	841	Moors	Mendip		166	3,091	73.5	372.4	19.7
55	Rode and Wingfield	1790-92	489		Rode Common		53				10.8
74	Rodney Stoke	1791-93	754	Moors			56	2,788	73.9	995.7	7.4
72	Croscombe and Dinder	1792-93	603		Mendip		Rate Levied				
73	Wells (East Horrington and Chilcot)	1792-94	701		Mendip		126	[1,449]	41.3	230.0	18.0
47	Kewstoke	1793-94	160	Moors			16	903	112.9	1,128.8	10.0
81	Wells (Out Parish of St Cuthbert)	1793-95	4,343	Moors	Mendip		773	11,319	52.1	292.9	17.8
65	East Harptree	1794-96	1,033		Mendip		255	2,580	49.9	202.3	24.7
41	Pilton and North Wotton	1794-96	961	Moors 882 acres	Mendip 79 acres		62	3,199 ²	72.5	1,031.9	7.0
42	Banwell	1795-97	1,001	Moors	Mendip		138	4,060	81.1	588.4	13.8
38	Cheddar	1795-1801	(4,400)	Moors ← 4,000 acres →	Mendip	400 acres Open Fields	587	8,119	36.9	276.6	13.3

TABLE I (continued)

SRO /RDe	Parish	Common Land					Land Sold Acres	Cost of Enclosure £	Financial Cost per Acre shillings	Selling Price of Land Per Acre shillings	Economic Cost. Per- centage Sold
		Act — Award	Acreage enclosed	Lowland Waste	Upland Waste	Open Fields					
23	Chewton	1797-1800	2,266		Mendip		345	5,567	49.1	322.7	15.2
13	Shipham and Winscombe	1797-99	1,072		Mendip		550	3,129	58.4	113.8	51.3
76	Portbury	1798-1806	962	Moors	Mendip Outlier		244	5,393	112.1	442.0	25.4
78	Clevedon	1799-1801	488	Moors	Mendip Outlier		52	1,762	72.2	677.7	10.7
70	Locking	1800-01	(161)	Moors			31	1,605	199.4	1,035.5	19.2
46	Tickenham	1801-03	561	Moors	Mendip Outlier		57	1,658	59.1	581.7	10.2
53	Worle	1801-03	211	Moors	Mendip		120	1,232	116.8	205.3	56.9
6	Backwell	1807-12	(885)		Mendip Outlier		277				31.3
60	Portishead and Weston- in-Gordano	1807-09	(800)	Moors	Mendip Outlier		Two Rates Levied	3,430	85.8		
33	Congresbury, Week St Lawrence and Puxton	1809 and 1814-16	(820)	Moors	Mendip Outlier	Open Fields	92	3,257	79.4	708.0	11.2
23	Weston- super-Mare	1810-15	993	437 acres Moors	417 acres Mendip	139 acres Open Fields	72	4,972	100.1	1,381.1	7.2
24	Wrighton and	1810-13	} (3,650)	Moors	Mendip Outlier		210	} 555			15.2
35	Yatton and Kenn	1810-15					+ 345				
33	Cheddar, Priddy and Rodney	1811 and 1816-21	(1,100)		Mendip		644	7,570	137.6	235.1	58.5
19	Long Ashton	1813-20	(690)		Mendip Outlier	Open Fields	65				9.4
24	Uphill	1813-18	388	Moors ← 348 acres →	Mendip	40 acres Open Fields	57				14.7
29	Wraxall, Nailsea and Flax Bourton	1813-19	(1,617)	Moors	Mendip Outlier	Open Fields	96 (21 acres sold for £1,279 = 1,218.1 per acre)				5.9
4	Berkley and Standerwick	1814-18	(300)		Commons	Open Fields	49	1,794	119.6	732.2	16.3
88	Portishead	1814-23	703		403 acres Mendip Outlier	300 acres Open Fields	41	2,150 ³	106.7	1,048.8	10.2
13	Dundry	1815-19	(236)		Cotswold Outlier		46	[1,821]	154.3	791.7	19.5

Source: Enclosure awards as indicated.

Notes: 1 Parentheses indicate an estimated figure, usually derived from the Act of Parliament. Square brackets indicate a figure arrived at by calculation, usually from information within the award.

2 Costs do not refer to the upland acres, as the Mendip proprietors asked that they should pay their own charges.

3 Costs do not refer to the open fields, whose proprietors bore a separate charge. This discretionary power was authorized in four of the later acts covering both waste lands and open fields, but it appears to have been exercised only in this case.

TABLE 2
North Somerset Enclosures Ranked According to Average Selling Price of Land Per Acre

<i>Act</i>	<i>Parish</i>	<i>Average Selling Price Per Acre Shillings</i>	<i>Percentage of Land Sold</i>	<i>Cost of Enclosure Per Acre Shillings</i>	<i>Factors Influencing Price of Land</i>
1810	Weston-super-Mare	1,381.1	7.2	100.1	Extra- agricultural value
1813	Wraxall, Nailsea, etc	1,218.1	5.9	No Evidence	
1778	Brislington	1,170.0	5.0	58.5	
1793	Kewstoke	1,128.8	10.0	112.9	Grazing land
1814	Portishead	1,048.8	10.2	106.7	
1800	Locking	1,035.5	19.2	199.4	
1794	Pilton and North Wotton	1,031.9	7.0	72.5	
1791	Rodney Stoke	995.7	7.4	73.9	Proximity to markets
1815	Dundry	791.7	19.5	154.3	
1814	Berkley and Standerwick	732.2	16.3	119.6	
1809	Congresbury	708.0	11.2	79.4	Grazing land but with value lowered by lesser quality moorland (salt wharves) or inclusion of uplands
1799	Clevedon	677.7	10.7	72.2	
1777	Compton Bishop	603.6	10.2	61.5	
1795	Banwell	588.4	13.8	81.1	
1801	Tickenham	581.7	10.2	59.1	
1788	Bleadon	490.1	20.4	99.7	
1798	Portbury	442.0	25.4	112.1	
1788	Westbury	372.4	19.7	73.5	(moors) (moors) Mendip Commons with values raised in two cases by inclusion of moorlands
1797	Chewton Mendip	322.7	15.2	49.1	
1793	Wells	292.9	17.8	52.1	
1795	Cheddar	276.6	13.3	36.9	
1811	Cheddar	235.1	58.5	137.6	
1792	Wells	230.0	18.0	41.3	
1782	Wookey	211.1	34.5	72.7	
1801	Worle	205.3	56.9	116.8	
1794	East Harptree	202.3	24.7	49.9	
1784	Blagdon	145.7	29.3	42.6	
1787	West Harptree	123.4	51.1	63.1	
1788	Compton Martin	120.0	56.0	67.2	
1797	Shipham and Winscombe	113.8	51.3	58.4	

Source: See Table 1.

TABLE 3
Variations in Land Value Within North Somerset Enclosures

		<i>Selling Price in Shillings Per Acre</i>				
<i>Act</i>	<i>Parish</i>	<i>Moors</i>	<i>Mendips</i>	<i>Other Lowlands</i>	<i>Other Uplands</i>	<i>Non-agricultural Use</i>
1777	Compton Bishop	603.6				
1778	Brislington					1,170.0
1782	Wookey	671.6	89.2			
1784	Blagdon		145.7			
1787	West Harptree		123.4			
1788	Bleadon	807.8	266.0			
1788	Compton Martin		120.0			
1788	Westbury	904.9	197.8			
1791	Rodney Stoke	995.7				
1792	Wells		230.0			
1793	Kewstoke	1,128.8				
1793	Wells	1,240.0	225.3			
1794	East Harptree		202.3			
1794	Pilton and N Wotton	1,031.9				
1795	Banwell	1,075.0	366.7			
1795	Cheddar	1,129.8	129.2			
1797	Chewton Mendip		322.7			
1797	Shipham and Winscombe		113.8			
1798	Portbury			667.7	244.8	
1799	Clevedon			677.7		
1800	Locking	1,035.5				
1801	Tickenham			581.7		
1801	Worle		205.3			
1809	Congresbury	2,800.0			347.2	
1810	Weston-super-Mare	1,329.5				1,667.2
1811	Cheddar		235.1			
1813	Wraxall, Nailsea, etc					1,218.1
1814	Berkley and Standerwick				732.2	
1814	Portishead				765.9	3,624.6
1815	Dundry				791.7	

Source: From additional evidence in the enclosure awards this Table develops the findings of Table 1, column VI.

TABLE 4
Average Cost per Acre of Parliamentary Enclosure (in shillings)

Period	1 Parliamentary Enclosure	2 North Somerset Act Award	3 North Somerset Act Award	4 Parliamentary Waste Land Enclosure	Period
1740-59	10.5 (30)			40.0	Before 1760
1760-69	12.7 (76)				
1770-79	19.3 (88)	47.7 (3)	42.2 (2)		
1780-89	19.2 (34)	69.8 (6)	57.9 (3)	61.5 (11) 62.4 (9)	1761-92
1790-99	31.0 (73)	67.7 (12)	70.5 (12)	82.5 (13) 75.0 (12)	1793-1801
1800-15	42.8 (17)	115.9 (10)	92.4 (9)	111.9 (7) 94.8 (5)	1802-15
1816-	67.3 (8)		119.5 (5)	119.5 (5) 120.0	1816-

Parentheses indicate number of awards consulted

Sources:

Cols 1 and 4 Holderness, op cit, pp 162-9. From the table on which col 1 is based administrative costs were excluded.

Cols 2 and 3 Table 1. In the absence of any general convention as to the grouping of enclosure costs by the year of the act (Turner, thesis, pp 286-7) or the award (Martin, op cit, pp 145-7), both are shown here. In col 2 this evidence is timed to fit with col 1. That in col 3 fits with col 4.

TABLE 5
Analysis of Capital Improvement Costs in North Somerset Enclosures

	Surveyor's Fees £	Roads £	Fences and Walls £	Drainage Ditches £	Gates and Bridges £	Total Cost of Con- struction £	Improvement Costs Per Acre Shillings
1 Mendip Enclosures mid-1790's	80	350	850		56	1,336	33.4
2 Lowland Enclosures mid-1790's	140	450		850	140	1,580	39.5
3 Shipham and Winscombe Enclosure 1797-99	106	46	1,262		Included in Roads	1,414	26.4
4 Weston-super-Mare Enclosure 1810-15	399	2,448 including sea wall				2,847	57.3
5 Congresbury, Week St Lawrence and Puxton Enclosure 1809-16	916	including road making costs of £102			398 Bridges	1,314	32.0

Sources: 1 and 2 Billingsley, op cit, pp 55-62.

3 SRO Q/RDe 13.

4 SRO Q/RDe 123; WSM Pub Ref Lib LOO/53, S/W17/43.

5 SRO Q/RDe 133; BAO 32395(21), 25642.

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39 *Acts of Privy Council, 1592*, pp. 11–12; R. Bennett and J. Elton, *A History of Corn Milling*, 4 vols (1898–1904), III, pp. 168–71; R. B. Westerfield, *Middlemen in English Business* (Newton Abbot, 1968 edn), p. 168. Millers at Hertford, Ware, Broxbourne and, possibly, Waltham invested in barges: Fairclough, 'The River Lea 1571–1757', pp. 76–7.

40 For a description of the terms and details of their activities: Westerfield, *Middlemen in English Business*, pp. 134–74; D. O. Pam, *Tudor Enfield: the Maltmen and the Lea Navigation*, Edmonton Hundred Historical Society, Occasional Papers, new series no. 18 (undated), pp. 3–7.

41 Bill submitted in 1585: PRO, SP 12/177 nos 8, 10 (dating of bill: Bodl. MS Rawlinson Essex 11, fo. 93). Petitions: BL Landsdowne MS 32 no. 40, 38 nos 32, 34, 35, 41 no. 48, 80 no. 38; PRO, SP 12/146 no. 86, 12/177 no. 9; Bodl. MS Rawlinson Essex 11, fos 89–98. Details of riots and disputes: Pam, *Tudor Enfield*, pp. 8–10; E. M. Hunt, *The History of Ware*,

(Hertford, 1986 reprint), pp. 18–20; Jackman, *Development of Transportation*, pp. 165–8; Fairclough, 'The River Lea 1571–1757', pp. 80–99.

42 CLRO MS 36c, fos 2–35; PRO, STAC 5 L46/6; Bodl. MS Rawlinson Essex 11, fo. 89; *Acts of Privy Council, 1591–92*, pp. 537, 553–4; *Acts of Privy Council, 1592*, pp. 11–12.

43 CLRO, MS 36c, fos 2–28, 174–7; Essex Record Office, Calendar of County Records (Essex), Sessions Records 1590–96, nos 123/47, 123/93; PRO C234/20.

44 CLRO MS 36c, fos 2–38, 50–92; BL Landsdowne MS 76 no. 55; PRO, SP 12/248 no. 97.

45 BL Landsdowne MS 77 no. 16.

46 For details of the re-emergence of the traditional system and its success in the ensuing century: Fairclough, 'The River Lea 1571–1757', pp. 100–10; 'The River Lea before 1767', *The Journal of Transport History*, 3rd series, X (2) (1989), pp. 128–44.

47 BL Landsdowne MS 53 no. 82, 60 no. 35; PRO, SP 15/30 no. 38.

Acknowledgements

I wish to thank Caryl Faraldi for her help with this article; Dr John Miller and Professor S. R. Dennison for their work on my thesis from which this article is extracted; the late Professor Fisher for his comments when I first tried to formulate these ideas; and the Marquess of Salisbury for permission to reproduce the map which accompanies the article.

The turnpike roads: a classic trap?

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The long-awaited volume of *Studies in Capital Formation in the United Kingdom 1750–1920*¹ includes a chapter of special interest to readers of this journal, entitled ‘Roads and Waterways, 1750–1850’. Although contributed by John Ginarlis and Sidney Pollard,² it is made clear that it is based on the thesis by the former, completed in 1970.³ In a lengthy first footnote the authors dismiss my recent and inconveniently timed contribution to the study of the turnpike roads, published in the *Economic History Review* of 1986, in which I suggest that certain general studies of the turnpike trusts had failed to take into account the way in which individual bodies continued to evolve within the developing network of roads.⁴ Ginarlis and Pollard claim that they have looked carefully at the former’s material and find no reason to modify their procedure or conclusions. They assert that ‘earlier local historical work had demonstrated conclusively that the Bath and Bristol trusts discussed by Buchanan were highly atypical as regards administration, extent, and outlay’. I am charged with falling into ‘the almost classic trap of arguing from a particular case study to the general’.⁵

This charge is unacceptable. The point at issue is that of whether or not the mileage and expenditure patterns authorised by the renewal and amendment Acts altered significantly the development profile of turnpike trusts. My comments on this important matter did not arise solely or even primarily from evidence on the Bath Turnpike Trust. The criticisms of Ginarlis’s work were based upon sources internal to that study which failed to provide the justification for his thesis claimed by the author. Ginarlis had based his estimates of outlay on the English turnpike roads from 1750 to 1822 upon a process of backward extrapolation from the established figures for the decade 1822–32 to the uncertain years of the mid-eighteenth century on the assumption that ‘trust mileages had remained constant over the period 1750–1822 and that expenditure patterns similar in the 1820’s did not change from 1750’.⁶ However, the small number of case-studies and the sample of trusts quoted do not fully justify

this crucial assumption. If the evidence of the 1820s is not an accurate reflection of trusts in their earlier years, then the procedures by which expenditure patterns have been calculated must also be flawed.

In support of his contention Ginarlis cites G. H. Tupling's study of the Lancashire trusts, but this offers little that is germane to the issue other than the observation that at a time when no new turnpike authorities were being created in the county 'several already in existence obtained powers to take over additional lengths of road'.⁷ Reference is also made to F. H. Maud's account of the Hockerill Highway, yet here new works and improvements are a continuing theme, especially after the renewal and amendment Act of 1791 further enlarged the powers of the Trustees.⁸ Two studies of London trusts cited by Ginarlis also refute his assumption. P. L. Payne shows how the Bermondsey, Rotherhithe and Deptford Trust, founded in 1748, received authorisation for a new road in 1798, for which purpose an additional sum of nearly £2,000 was borrowed. In the next decade further powers were sought for new work on which costs had reached £6,468 by 1810.⁹ C. A. Allen Clarke describes the work of the Islington and Marylebone Trusts, founded in 1716 and 1721, respectively, on their shared New Road begun in 1756.¹⁰ Investment costs on this extra work were so high they top the list in a table of trust expenditure per mile compiled by Eric Pawson.¹¹ Another view of this major new construction work is to be found in F. H. W. Sheppard's study of local government in St Marylebone. He describes the provisions of a further Act five years later, under which the northern ring road was extended substantially at its eastern end to Moorgate.¹² F. H. Maud summed up the general position by his judgement that on the Hockerill Highway 'The maintenance and *enlargement* [my italics] of the road was the main duty of the Trust',¹³ and this conclusion was endorsed by my study of the Bath Turnpike Trust which revealed an increase over time in terms of both mileage and expenditure. In view of the persistent evidence provided by these studies, it is difficult to see how the notion that the turnpike roads remained unchanged over the years can be sustained as the basis for a crucial assumption about mileage.

Ginarlis's complementary assumption that expenditure patterns had also remained unchanged over the years from 1750 to 1822 may likewise be criticised from sources internal to the thesis, especially the sample of fifty-five trusts described as providing guidance in this matter. Despite its significance for the construction of estimates of investment, information on the 'detailed figures for 1750–1822 from some 55 trusts'¹⁴ is not included in the chapter on 'Roads and Waterways', but must be sought in the thesis. Here Table XI provides the basic list of fifty-five 'Names of Roads with Original Outlay Figures, 1750–1822', but this information is patchy because of the uneven span of years during which each trust functioned and the varying availability of surviving documents for that period.¹⁵ For example, in the mid-eighteenth century, towards which the

extrapolation is directed, the evidence for 1750–51 rests on three trusts, totalling 34 miles, all in London, and all founded in the early decades of the century and so well beyond the period of their establishment. On this important matter of initial costs information is limited to twenty-four trusts, of which fourteen are from the two counties of Kent and Yorkshire.¹⁶ Fuller details of the outlay of trusts listed in Table XI are divided confusingly between Table XX and Appendix B. Of these, Table XX provides a 'Sample of Detailed 18th Century Turnpike Expenditure' and gives information on thirteen trusts.¹⁷ Appendix B is entitled promisingly 'Quasi-Net Expenditure Figures for Fifty-Five Turnpike Trusts', but provides this information for only forty of them.¹⁸ When added together, the total is fifty-three not fifty-five, as a result of confusion between the counties of Northamptonshire and Warwickshire, and the two sets of figures may not be compatible for one shows 'Expenditure' and the other 'Quasi-Net Expenditure'. When the argument moves to the 'Extrapolated Totals' of Table XIII, used as the basis of the study, the responsibility borne by the sample of trusts is revealed, for their historical input forms a very low proportion of what is nevertheless described as 'Total Expenditure'.¹⁹ Even if displayed more convincingly, it would still be difficult to see how the assumption of an unchanging pattern of expenditure could be justified from evidence which is so limited.

The four sets of data on which Ginarlis based his calculations of net outlay on English turnpike roads in the period 1750–1822²⁰ may also be criticised from sources within the study. First, 'detailed expenditure figures for each trust in the decade 1822–32' were examined for only half of the counties, the remainder being averaged from the returns for 1822 and 1829.²¹ Secondly, the expenditure figures for the fifty-five trusts were compiled with an even greater degree of approximation, for, as Table XII reveals, nearly half of all outlay figures per mile for the sample were based entirely upon estimations.²² Taken together, this means that the calculations of investment in the turnpike roads were founded to a considerable extent upon prior estimation within the database. Thirdly, the date of origin of each trust, which provides an essential benchmark in Ginarlis's calculations, is occasionally obscured, for example by a failure to recognise a change of name, leading to a distortion of a trust's evolutionary pattern.²³ Fourthly, there is the data on trust mileage in the 1820s. Evidence that this did not remain unchanged comes from trusts within the sample selected by Ginarlis, which includes three from Somerset. After their foundation in the 1750s each of these grew in size in the period in question: the Wells Trust by 40 per cent; the Yeovil Trust by 26 per cent; and the Taunton Trust by 17 per cent. These turnpikes were thus all smaller at inception than in later years, yet the length of road attributed to them by Ginarlis as that upon which outlay was expended over the whole period is that of their maturity. Further examples from this county, of the coastal district of the Minehead Trust and the rural roads of the West

Harptree Trust, which grew by 60 per cent and 25 per cent, respectively, suggest that these cases were not atypical.²⁴ The fourfold growth of the Bath Trust was explored in my article, and it is evidence from this body which also shows how patterns of finance in early years may have differed from the later system. Account books have not survived but a statement from the 1770s shows that current revenue from the tolls was then fully spent on repairs, interest payments and administration. In contrast, the financial statements for the 1820s and early 1830s show a considerable degree of sophistication in the handling of funds, with surplus revenue carried over from year to year to be invested in new works.²⁵ These later papers also distinguish between current revenue from the tolls and the capital sums raised (usually on a mortgage of the tolls), a distinction which is explored in the study of the Bath Trust but not by Ginarlis, who concentrates on the indiscriminate information provided by cash books and ledgers.

In the light of the four sets of data and on the assumptions already questioned, Ginarlis then slotted the turnpike roads by date of origin into a category determined by mileage and expenditure in the 1820s. Outlay patterns were formulated for individual trusts on the evidence from the sample, and so for the turnpike roads as a whole. If mileage in the 1820s was not an accurate reflection of length in the preceding years, then the whole system by which roads were classified is called into question, not only because this raises the possibility that roads should be placed in different categories at different stages in their life history but also because changes in mileage over the years are likely to have affected patterns of expenditure.

There is supporting evidence available from case-studies. Research like that by B. Keith-Lucas into the Kent turnpikes, for example, confirms the general point but without specific details. This is to be regretted since only one other county provides more examples in Ginarlis's sample of fifty-five. Keith-Lucas writes that legislation was 'complicated by the fact that each trust had not one, but a series of statutes, extending its powers and geographical area as well as the terms of its existence'.²⁶ In studies of the counties of Northumberland by W. G. Dodds and Essex by J. M. L. Booker, we find similar references to 'toll roads increasing in length and complexity', although again there is no estimation of the changes involved.²⁷ The work of Arthur Cossons on the counties of Nottinghamshire, Warwickshire, Northamptonshire, Norfolk and Wiltshire is impressively detailed in that all Acts relating to each trust are listed and categorised by function.²⁸ Those extending the powers of these bodies are thus indicated, but with no account of mileage. Two regional studies examine the problems of road building in difficult terrain. G. G. Hopkinson shows how the trusts of south Yorkshire and north Derbyshire met the need for a substantial re-alignment and improvement of earlier turnpike roads, as well as their extension, in the years after the framework of the systems had been created; and Christopher Cox

describes the continuing evolution of the turnpike roads of the Stroudwater area of Gloucestershire. In his view: 'The final roads before repeal and dispiking were often significantly different from the roads of the initiating Act.'²⁹

K. A. MacMahon's study of the turnpike roads of east Yorkshire adds further to the case. He observes that trusts sought to extend their terms and powers 'on the grounds that a larger unit was financially more secure and administratively more efficient',³⁰ and demonstrates this by details of when and where mileage was extended and roads re-aligned. Similarly detailed information is provided by three of the oldest studies in this sample. Benjamin Winstone's account of the Epping and Ongar Trust, which marshals evidence on a growing mileage from legislation, minute books and maps, was published in 1891,³¹ and instructive work on the Liverpool area and Bedfordshire was published in the mid-1930s. F. A. Bailey describes the extension of the Liverpool to Prescott, St Helens, Warrington and Ashton Turnpike Trust from its original 9 miles in 1726 to 13 miles in 1746, and 28 miles in 1753, with two further minor extensions in 1771 and a small alteration in 1802. Numbered milestones on a map make clear this sequence of change.³² F. G. Emmison's task was more complicated, for his survey covered nineteen trusts in Bedfordshire. The Biggleswade to Alconbury Hill Road was established in 1725. It grew by a series of renewal and amendment Acts in 1736, 1770 and 1791 to a total of 44 miles, almost twice its original length and the greatest mileage of any trust connected with that county.³³ The provision of a map again shows the developing pattern and growing mileage. Finally, recent work by A. D. M. Phillips and B. J. Turton has followed up my observations by noting that 23 per cent of all turnpike Acts in Staffordshire authorised some extension of an existing trust road, whilst 51 per cent renewed powers without extending mileage and 26 per cent authorised new trusts. The authors conclude: 'The number of such amending Acts emphasises their importance in augmenting the length of original routes in Staffordshire and underlines the necessity recognised by Buchanan to examine such subsequent Acts in any study of turnpike evolution.'³⁴

This evidence from a range of case-studies does not, of course, constitute a claim that all trusts evolved in the same manner, and a reading of the two general studies published in the 1970s by Eric Pawson and William Albert confirms this. Despite the renewal and amendment Acts not being a special area of study for either author, Pawson noted that over one-third of such Acts passed before 1770 'added extra mileage to their respective trusts, the average amount being anything from five to fifteen miles, decade by decade'; whilst Albert conceded that: 'Some renewal acts placed additional roads under the trustees' jurisdiction',³⁵ so casting doubt upon a procedure which assumes size to be constant and then bases estimates of outlay upon that assumption.

What is now at issue is not whether this enlargement of the trusts happened at all, but the extent to which it occurred and the significance of this evolutionary

growth for investment patterns. On this the aggregationists have nothing to say, for their methods cannot cope with the complexities of the historical situation. In my article I suggested case-study evidence could reveal some of the over-simplification and distortions which might arise from the formation of national assessments on an inadequate historical base. I argued that such evidence may not only correct but also amplify and sustain the more general approach. I no longer think such complementarity is possible. Ginarlis and Pollard claim in 'Roads and Waterways' that: 'The estimates are deliberately cast in such a form that they may easily be improved as more original turnpike material comes to light and is investigated',³⁶ but their summary dismissal of the legitimate concerns raised in my article suggests instead that the two approaches are fundamentally incompatible. As it is employed in this research, the aggregative method proceeds by the development of a self-contained system which is not susceptible to refinement by later historical evidence. Any new material which throws doubt on assumptions and methods is not welcome and must be therefore either ignored or rejected.

The question of the profile of trusts at different stages in their life history is too important an issue to be dismissed, for it concerns more than the history of the turnpike roads and their contribution to capital formation in the United Kingdom. It is also central to the question of historical evidence, method and understanding. The 'classic trap' at the heart of this debate is not that of arguing from the particular to the general, but that of producing national statistics of investment from a base which is imperfect in terms of theory and inadequate in terms of evidence.

Notes

1 Charles H. Feinstein and Sidney Pollard (eds), *Studies in Capital Formation in the United Kingdom 1750–1920* (Oxford, 1988).

2 John Ginarlis and Sidney Pollard, 'Roads and Waterways, 1750–1850', in Feinstein and Pollard (eds), *Studies in Capital Formation*, pp. 182–224.

3 J. E. Ginarlis, 'Road and Waterway Investment in Britain, 1750–1850', unpublished Ph.D. thesis, University of Sheffield, 1970.

4 B. J. Buchanan, 'The evolution of the English turnpike trusts: lessons from a case study', *Economic History Review*, 2nd series, XXXIX (2) (1986), pp. 223–43.

5 Ginarlis and Pollard, 'Roads and Waterways', p. 182.

6 Ginarlis, 'Road and Waterway Investment', p. 103; see also this assumption as expressed by Ginarlis and Pollard in 'Roads and Waterways', p. 196, 'that trust mileages had remained constant over the period 1750–1822, and that expenditure patterns of the

1820s could be applied to the whole period from 1750'.

7 G. H. Tupling, 'The turnpike trusts of Lancashire', *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, XCIV (1953), p. 43.

8 F. H. Maud, *The Hockerill Highway* (Colchester, 1957), pp. 27–9.

9 P. L. Payne, 'The Bermondsey, Rotherhithe and Deptford turnpike trust, 1776–1810', *The Journal of Transport History*, II (3) (1956), pp. 138–9, 142 n. 52. Ginarlis's footnotes contain many errors relating to authors and publications, but his miscitation of this work by Payne is the most serious, for the reader is referred to a University of London M.A. thesis of this title for 1952 which enquiries have confirmed does not exist.

10 C. A. Allen Clarke, 'The Turnpike Trusts of Islington and Marylebone from 1700 to 1825', unpublished M.A. thesis, University of London, 1955, pp. 35–8, 200, 217, 229.

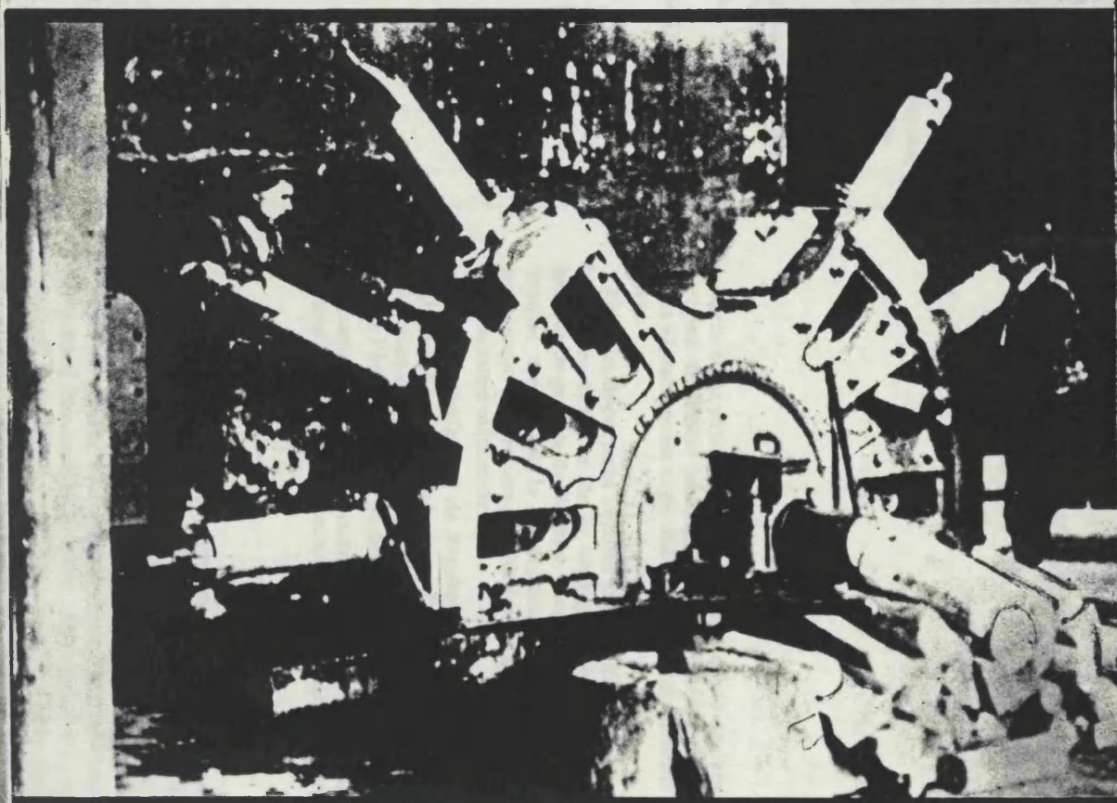
- 11 Eric Pawson, *Transport and Economy: the Turnpike Roads of Eighteenth-Century Britain* (1977), pp. 231–3.
- 12 F. H. W. Sheppard, 'Local Government in St Marylebone, 1688–1835: a Study of the Vestry and the Turnpike Trust', unpublished Ph.D. thesis, University of London, 1953, pp. 124–34.
- 13 Maud, *Hockerill Highway*, p. 20.
- 14 Ginarlis and Pollard, 'Roads and Waterways', p. 196.
- 15 Ginarlis, 'Road and Waterway Investment', pp. 116–18.
- 16 *Ibid.*, pp. 116–21.
- 17 *Ibid.*, pp. 145–53. On p. 107 the table linked with Appendix B is erroneously cited by Ginarlis as Table XIV.
- 18 *Ibid.*, pp. 348–77.
- 19 *Ibid.*, pp. 114, 122–3.
- 20 *Ibid.*, pp. 102–7; Ginarlis and Pollard, 'Roads and Waterways', p. 196–7.
- 21 Ginarlis, 'Road and Waterway Investment', pp. 78, 102. Durham is given as an example of this procedure in Table 8.2, Ginarlis and Pollard, 'Roads and Waterways', p. 195, but important details of mileage are here missing for more than one-quarter of the trusts in that county.
- 22 Ginarlis, 'Road and Waterway Investment', pp. 110–11, and 'Breakdown of Sample Figures', pp. 119–21.
- 23 *Ibid.*, Appendix A, Turnpike Returns 1822–33, pp. 295–347. For example, figures for the Buckland Dinham Turnpike in Somerset are displayed on p. 332 for the years 1822–29 separately from those for the Radstock Turnpike on p. 331 for the years 1830–32 and with no indication that these were the same body which had operated under the former name since 1768.
- 24 Somerset Record Office (SRO). Schedule D/T lists trusts and the roads authorised, with all extensions. Also O. B. Morland, *An Introduction to the Infrastructure of the Industrial Revolution in Somerset* (1982); and J. B. Bentley and B. J. Murless, *Somerset Roads: the Legacy of the Turnpikes*, I, *Western Somerset*, II, *Eastern Somerset* (1985 and 1987).
- 25 SRO D/Tba, Min. Bk 8, Summary of Accounts 1770–76; Q/R Turnpike Trust Returns, General Statements of Account 1823–33.
- 26 B. Keith-Lucas, 'Kentish turnpikes', *Archaeologia Cantiana*, C (1984), p. 351.
- 27 W. G. Dodds, 'The Turnpike Trusts of North-umberland', unpublished M.A. thesis, University of Durham, 1965; J. M. L. Booker, 'The Essex Turnpike Trusts', unpublished M.Litt. thesis, University of Durham, 1979, p. 32.
- 28 Arthur Cossons, *The Turnpike Roads of Nottinghamshire* (1934); 'Warwickshire turnpikes', *Transactions of the Birmingham Archaeological Society*, LXIV (1946), pp. 53–100; 'The turnpike roads of Northamptonshire with the Soke of Peterborough', *Northamptonshire Past and Present*, I (3) (1950), pp. 28–46; 'The turnpike roads of Norfolk', *Norfolk Archaeology*, XXX (1951), pp. 189–212; 'Roads', *Victoria County History of Wiltshire*, IV (1959), pp. 254–71.
- 29 Geoffrey Gill Hopkinson, 'The Development of Lead Mining and of the Coal and Iron Industries in North Derbyshire and South Yorkshire, 1700–1850', unpublished Ph.D. thesis, University of Sheffield, 1958, pp. 13–20; Christopher Cox, 'The Development and Decline of the Turnpike System in the Stroudwater Area of Gloucestershire, 1725–1825', unpublished Ph.D. thesis, University of London, 1987, pp. 115–16.
- 30 K. A. MacMahon, *Roads and Turnpike Trusts in Eastern Yorkshire*, East Yorkshire Local History Series, No. 18 (1964), p. 19.
- 31 Benjamin Winstone, *Minutes of the Epping and Ongar Highway Trust, 1769–1870* (1891), pp. 130–48, 197–209. I am indebted to Mr John Boyes for drawing my attention to this work.
- 32 F. A. Bailey, 'The minutes of the Trustees of the turnpike roads from Liverpool to Prescott, St Helens, Warrington and Ashton in Makerfield, 1726–89', *Transactions of the Historic Society of Lancashire and Cheshire*, LXXXVIII (1937), pp. 159–60 and map facing p. 200, and LXXXIX (1938).
- 33 F. G. Emmison, 'Turnpike roads and toll gates of Bedfordshire', *Bedfordshire Historical Record Society*, III (1936), pp. 11–13.
- 34 A. D. M. Phillips and B. J. Turton, 'Staffordshire turnpike trusts and traffic in the early nineteenth century', *The Journal of Transport History*, 3rd series, VIII (2) (1987), p. 127. References to established trusts undertaking 'entirely new roads' in this county may also be found in the study by S. A. H. Burne and M. J. Wise, 'Roads', *Victoria County History of Staffordshire*, II (1967), reprinted as *A History of Roads and Canals in Staffordshire* (1984), pp. 280–3.
- 35 Pawson, *Transport and Economy*, p. 105; William Albert, *The Turnpike Road System in England, 1663–1840* (Cambridge, 1972), pp. 121–2.
- 36 Ginarlis and Pollard, 'Roads and Waterways', p. 200.

Dr Ginarlis has seen this article and is preparing a reply. Unfortunately it was not ready when the journal went to print and will appear in a future number.

Editor

l'étude et la mise en valeur du patrimoine industriel

4^e Conférence internationale LYON-GRENOBLE
Septembre 1981



Éditions du CNRS



1. COURTEAULT (Paul), « La construction du pont de Bordeaux », *Actes de l'Académie des sciences, lettres et arts, de Bordeaux*, 1921 (*Ac. Acad. de Bx* dans les autres notes).

2. Les renseignements biographiques sont tirés pour une large part de : PAUL (Jacques) : « Trois ingénieurs célèbres de l'Académie de Bordeaux : Teulère, Deschamps et Billaudel ». *Ac. Acad. de Bx*, 1977.

3. Vertus : Dept. de la Marne, arr. de Châlon-sur-Marne, ch.l.c.

4. BLOCK (Maurice) : *Dictionnaire de l'administration française*, Paris, Berger-Levrault, 2^e éd. 1881, p. 1521. *Histoire générale des techniques* sous la direction de Maurice Daumas, t. III, « l'Expansion du machinisme », Paris, P.U.F., 1968, p. 255.

5. Pont de Neuilly et pont de la Concorde à Paris. *Histoire Générale des techniques*, p. 269.

6. 6 J 79. Church fut primé par l'Académie de Bordeaux en 1818 pour cette réalisation dont Billaudel rendait compte. Son rapport est accompagné d'une lithographie de Cabillet représentant la machine.

7. 6 J 79. Tableau des navires à vapeur construits à Bordeaux de 1818 à 1822, et principales caractéristiques.

8. Entrepôt réservé aux marchandises sous douane.

9. Basilide : « Philosophie gnostique de l'école alexandrine (II^e siècle ap. J.C.) qui prétendait concilier le christianisme avec l'aristotélisme et le stoïcisme » (*Nouveau Larousse Universel*, Paris, 1948).

10. « Notice sur la cloche à plonger... par M. BILLAUDEL... » *Ac. Acad. De Bx*, 1820, p. 79-98 et 6 J 84. Documentation personnelle sur les cloches à plonger.

11. Documents communiqués par la division « Ouvrages d'art » de la D.D.E. de la Gironde.

12. 6 J 78.

13. Cenon, commune de la rive droite de la Garonne, proche de Bordeaux.

Membre de la Légion d'Honneur depuis 1825, son dossier contient la déclaration obligatoire de son décès par le maire de Cenon du préfet de la Gironde. Archives de la Gironde, I M 800.

14. *Ac. Acad. de Bx*, de 1820 à 1828 et tables des actes de 1712 à 1875.

THE USE OF DOCUMENTARY SOURCES IN THE INTERPRETATION OF PHYSICAL EVIDENCE : THE WOOLEY POWDER WORKS NEAR BRISTOL A CASE STUDY

BJ. BUCHANAM*

Après avoir exposé les raisons de la rareté des vestiges de manufactures de poudre dans la région de Bristol (réutilisation des sites à d'autres fins), l'auteur indique que les seules traces véritablement exploitables sont des documents d'archives, émanant souvent de fonds privés.

Ainsi, les documents déposés par la famille Strachey aux Archives du Somerset (principalement des bilans et de la correspondance commerciale) donnent des indications sur la fabrique de poudre de Wooley. Bien que très particulier, ce type d'informations est riche de données concernant la localisation géographique de ce type de manufactures, le rôle économique de la région où elles étaient implantées, et l'apport de témoignages nouveaux sur cette industrie méconnue.

Pour la manufacture de Woolley, l'auteur est en mesure de décrire, en s'appuyant sur le fonds Strachey et les recherches d'un ingénieur, le déroulement des différentes étapes de la production de la poudre, depuis la qualité du mélange de sulfure, de salpêtre et de charbon, jusqu'à l'écoulement de la production dans un contexte économique parfois difficile.

L'auteur conclut en insistant sur le fait que « ce sujet négligé aurait beaucoup à gagner à l'utilisation des sources documentaires pour l'interprétation des sites ».

During the eighteenth century gunpowder was manufactured at several rural sites in the Bristol region, but the physical remains of this industry are fragmentary and elusive. This is because powder making declined in this area in the early decades of the nineteenth century, and with the passage of time here has been an inevitable decay and re-use of the structures on these sites. Some buildings were probably dismantled because they were considered an explosive hazard, whilst others were absorbed into farms or, more recently, converted into secluded houses. In one case the whole site has been lost under the waters of a reservoir serving the city of Bristol.

Elsewhere, however, some features do still exist, chiefly in the form of overgrown millponds and their associated water courses, ruined structures, and those foundations and walls which were incorporated in later buildings now serving agricultural or domestic rather than manufacturing purposes.

The paucity of this physical evidence is such that it can do little more than arouse the interest of the historian in this neglected process, and prompt a search for further information from archival or documentary sources. Unfortunately appropriate source material providing detailed evidence on individual manufacturing sites is extremely difficult to find, chiefly because in England such works were usually privately owned and operated and the survival of their business papers has therefore been particularly haphazard. In contrast, institutional, administrative, and local and central government records are more likely to have survived in a systematic and comprehensive form. This therefore affords a greater prospect of success to an extensive study of the location and distribution of sites based on, for example, institutional material such as insurance records, than it does to an intensive study of individual sites, based as that must be on the entirely fortuitous survival of private papers.

DOCUMENTARY EVIDENCE

Fortunately for the subject of powder making, some useful documents have been found in the archives of the Somerset Record Office amongst the papers deposited by the Strachey family. It is a disadvantage that this evidence relates in detail to only one site, at a small village near Bath called Woolley, and that the papers are more concerned with financial than technical matters. Within these limitations, however this documentary source is a very good one because of the continuity of evidence provided through the annual balance sheets which survive for most years from the 1740s to the early nineteenth century. There are also partnership agreements and leases from the 1720s, and bundles of correspondence dealing with particular subjects such as the sale of gunpowder to the government. The Strachey family were a Somerset landed gentry family who had acquired an interest in the Woolley works through marriage into a Bristol merchant family. Their residence in London for much of the year and closeness to court and government circles led to a lobbying of officials on behalf of the partners, and it was this circumstance which occasioned much of the correspondence filed away by the family together with the annual financial statements. These last papers show the business to have been a very profitable one, which may explain the continuing interest of the Strachey family in what must otherwise have seemed a very unlikely enterprise for this family.

Despite the intrinsic interest of these papers for any historian with a concern for past industrial processes, it is nevertheless important that the consequent focussing of attention upon one powder making site should be justified in general terms if the criticism of antiquarianism is to be avoided. Happily, such a justification can be made at three levels. First, this study of an individual site prompts new ideas about the general chronology and location of powder manufacture in England ; second, it gives rise to a new insight into the economy of the region ; and third, it makes a contribution to the evidence required for a comparative study of this hitherto neglected industry.

On the first point it may be stated that the local mills flourished in the eighteenth century near a western seaport, and that they made powder for both mining and musketry. But the mills founded in previous centuries had been located in the south east, near London, and they had concentrated on powder for warfare, whilst those founded later in the north west and south west, in the Lake District and Cornwall, produced powder for use in mining operations. For much of the eighteenth century therefore, the mills of the Bristol hinterland such as Woolley occupied a special place and role in the manufacture of powder in England, in terms of its changing location and function.

Secondly it may be suggested that although located in the countryside for reasons of water power and safety, powder making was essentially a port industry. The mills at Woolley were dependent upon Bristol for the use of its shipping facilities and credit network, and for the provision of personnel, including not only the partners who invested capital in the enterprise and managed the business, but also the skilled craftsmen of the port who made, for example, the barrels used in the transport of powder. Saltpetre and sulphur from such widely ranging sources as the Baltic, the Mediterranean and India, came to Woolley through the port, and from in the gunpowder was shipped coastwise to Wales, Cornwall and Liverpool, and overseas to Ireland and the American colonies. But the relationship had a still deeper significance, for the Woolley mills made an important contribution to the economy of the region through the operation of the slave trade. Gunpowder was one of the commodities used in the bartering for slaves, and it was carried by those vessels leaving Bristol to engage in this business on the west coast of Africa. This was the first leg of a triangular trade. The next stage was the shipping of the human cargo across the Atlantic to the plantations from which, lastly, were carried raw materials such as sugar and tobacco for processing in the home port, Bristol. When powder sales declined at the end of the eighteenth century, their letters show that the Woolley partners attributed this to the decline of the slave trade. Also important was the establishment of rival mills in former markets such as Cornwall and the United States, and the failure of the partners to invest in and diversify their business. It is of interest to note, lastly, that the decline of the powder industry mirrored the lessening importance of the port of Bristol itself in the course of the eighteenth century, especially in relation to the newer western seaport of Liverpool.

The third point, that of the contribution an individual study may make towards the comparative evidence on a subject in general will be considered at the end of this short paper, when matters such as the process of manufacture and the layout of the site have been treated more fully.

THE USE OF DOCUMENTARY SOURCES IN THE INTERPRETATION OF PHYSICAL EVIDENCE

For convenience, this question will be considered under three headings, First, the processes carried out on the site, for evidence on this matter will indicate the range of buildings which formerly existed at Woolley. Second, the provision of water power and the disposition of buildings on the site, for this evidence will suggest the likely flow of production. Third, the problems encountered in the manufacture and sale of powder, for this evidence will reveal something of the techniques employed at Woolley. However, when even the partners referred to the process of manufacture

as 'an art and a mystery' it is necessary to be cautious about how far it is possible to interpret the physical evidence in the light of the documentary sources.

First, the stages of production. From a memorandum of the mid-eighteenth century we know that the 'best powder' the manufactured at Woolley was a simple mix of Saltpetre (64 lb or 70 lb), sulphur (18 lb), and charcoal (18 lb). The inventories found in many of the annual financial statements show that when the stores were counted they included some saltpetre and sulphur which had been refined and some which had not. This suggest that there must have been equipment for the refining of both at the site, with vats and vessels and a good supply of pure water. The inventories also show that charcoal was bought from a local estate. Such large quantities are recorded that storage space, possibly in buildings, would have been essential.

From the memorandum referred to we learn that the ingredients were mixed or incorporated in four water-powered mills. Pressure was provided by vertically revolving edge runners. The resulting mixture was then pressed, the only stage to which the Woolley papers make no reference. After this, came the 'corning' of the powder, when it was forced through a sieve to produce compact grains which were less likely to crumble in transit. The inventory reference to some corned powder as still 'in dust' suggest that after granulation the powder needed to be screened. Evidence of the production of grains of a specified uniform size comes from those inventories which labelled stocks of finished powder separately as F, FF, or FFF, in increasing order of fineness of grain and therefore also of value. The papers also refer to the glazing mill and drying stove. These indicate the last two stages of production when the compacted grains were further rounded-off by glazing and then dried to remove the last vestige of the water added at the first stage to lessen the danger of an explosion. The finished product was first stored at the site, where the building of a new magazine was recorded in the balance sheets of the mid-eighteenth century. It was then transported to warehouses rented in Bristol, although that sold for use in local lead and coal mining probably went straight to those customers.

Second, the accommodation of this sequence of processes. The remains of the Woolley works are in a steep-sided valley with two mill ponds, a lower one in the valley and an upper one on the hillside. Each had its associated water courses. The structural remains suggest that there was a confused scatter of buildings on the site, an impression confirmed by contemporary maps, though these may show an artistic rather than a realistic representation of the arrangements. A clearer picture emerges when the legal papers are consulted, for the leases of the 1720s show that the upper location was the site of the powder mills. This may have been because the lower site was already occupied by corn mills, the fore-runners of which were listed in the Domesday Book of 1086. But there was also the problem of an inadequate and fluctuating water supply, revealed by the observation of a partner in 1801 that in June '...our Mills usually stand still for want of Water'. Therefore the utilisation of the upper site, stimulating as it did the construction of hydraulic engineering works which allowed for a maximisation of the supply of water for processing and power, may have been a positive response to the challenge of water shortage, and not simply an evasion of the already pre-empted lower site. This conclusion has been arrived at after much close consultation and lively discussion with an engineering colleague, Mr M.T. Tucker, who has made numerous drawings and plans of the site and its

features, and has measured the flow and course of the water supply. Our findings are shortly to be published in an article in a forthcoming issue of the *Industrial Archaeology Review* (Oxford University Press). It is an over-simplification of our study, but in brief we suggest that the raw materials were prepared at the top and middle of the site, that they then passed downhill to the incorporating mills between the mill ponds (the memorandum notes that the water for the four mills was 'worked twice over', suggesting an arrangement two by two), and thence to a number of sites for the finishing processes, some of which were water powered. The storage magazines were probably isolated on the other side of the valley.

Third, the problems encountered by the partners. The great value of the balance sheets with their inventories lies in the continuity of evidence they provide over some sixty years, but their disadvantage is that evidence of a technical nature is only incidental. With the correspondence on other hand, technical problems may be a first concern, but the letters rarely cover more than a short period, so that the evidence they provide can relate only to a cross-section of time within the continuing history of the firm. One such period however that of the 1760s, is of great interest because the partners were then trying unsuccessfully to sell powder to the government. Their failure led to a correspondence in which a number of problems were discussed, relating to the difficulties in the refining of saltpetre and sulphur, the importance of the weight and smoothness of the edge runners, and the length of time spent on the incorporation of each batch of powder. The advice of the Board of Ordnance that they should continue to experiment so that they '... may hit on the right methods as others have done' does not suggest that there was a high level of expertise and understanding amongst powder makers. Nevertheless, this insight into the practical problems the partners faced does illustrate the invaluable evidence to be gained from business letters. It should also be observed that the Woolley partners were not too distressed at this failure to meet the government's standards, for their other customers remained well-satisfied, including the privateers who sailed from Bristol during the many wars of the eighteenth century. However in the long run it may have been this failure, together with the decline in trade already noted, which caused production to cease at Woolley in the early nineteenth century. There was a 'consolidation' with the nearby powder works at Littleton, to which site the business was transferred.

It is hoped that the case for an intensive study of particular works, in which documentary sources are related to physical evidence, has now been made. However, the usefulness of such an approach is not limited to the interpretation of an individual site, for the body of detailed information thus provided can become the basis on which different sites are compared. Two examples may be given. First, at the level of technical details it may be observed that at Woolley incorporation was by edge runners from at least the mid-eighteenth century, yet at the Du Pont works in the Brandywine valley in the U.S.A. incorporation was by the more out-dated method of stamps until the 1820s. Second, at the level of the general lay-out of works, it may be suggested that the constraints of the site at Woolley, especially the problems of water supply, produced a sequence of water-driven installations down the hillside at right angles to the stream in the valley, in a pattern which contrasts greatly with the linear arrangement of buildings along a head leat parallel to the stream, to be seen at other powder works such as those at Frederiksvoerk in Denmark, founded in 1756. Clearly, this neglected subject would gain much from the use of documentary evidence in the interpretation of sites. It would also benefit

from the undertaking of a comparative analysis of the industry both within countries and internationally. Anyone interested in the exchange of information on this subject is invited to contact the writer through the Centre for the Study of the History of Technology at the University of Bath, U.K.

LES ARCHIVES D'ENTREPRISES COMME SOURCES DOCUMENTAIRE DE L'ARCHÉOLOGIE INDUSTRIELLE : PROBLÈMES DE MÉTHODE ET DE CONSERVATION.

Eliane CAROUGE*

Comme toute discipline historique, l'archéologie industrielle trouve une large part de sa documentation dans les archives. Nous ne nous arrêterons pas longuement ici aux archives publiques, mieux connues, mieux protégées et plus accessibles mais d'un intérêt limité en la matière. Non qu'elles en soient dénuées car l'État aussi est un bâtisseur ; de plus, il doit veiller à la sécurité et à la salubrité publiques menacées par les constructions industrielles, il étudie parfois quelque établissement pionnier dont l'exemple contribuera au développement de l'économie, il tranche les litiges ou, simplement, se préoccupe de l'assiette de l'impôt (1). Ceci n'est pas négligeable et représente sans doute la presque totalité des sources d'archives sur lesquelles on peut compter jusqu'au XVIII^e siècle. Cette documentation se poursuit ensuite, et se développe même, mais à partir du XIX^e siècle, elle ne suffit plus à la connaissance des constructions industrielles qui sont du domaine privé. C'est donc par les archives privées qu'il faudra la compléter.

La construction d'un bâtiment industriel, comme celle de tout bâtiment ou l'installation d'une machine, suppose la rencontre de plusieurs personnes : disons en simplifiant, celui qui commande, celui qui conçoit et celui qui construit. Celui qui commande un bâtiment industriel ou une machine est généralement un chef d'entreprise. C'est donc naturellement dans les archives de l'entreprise que l'on cherchera la documentation correspondante. En fait, ni cette construction ni cette machine ne sont le souci principal de l'entreprise : ils ne sont que des outils au service de cet objectif principal qu'est la production. Cette place secondaire a son reflet dans le relativement faible volume des documents qui décrivent les constructions et l'outillage dans nombre de fonds d'archives d'entreprises. Ceux-ci ne sont en réalité facteurs de dossiers que lorsque leur fonctionnement normal est empêché ou interrompu par une malfaçon ou une destruction inopinée (2). Nous sommes donc mieux renseignés sur les serviteurs défaillants que sur ceux qui remplissent normalement leur office. En revanche, on trouve dans les dossiers qui n'ont pas directement trait au domaine et à l'équipement de l'entreprise les raisons techniques

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⁸³ P.R.O. Marching Orders, WO 5/65, 24 Sept. 8 Nov. 1784. T 11/34, 15, 22 Nov. 1784.

⁸⁴ P.R.O. Adm. 1/4289, 2 Nov. 1784. WO 1/1026, 11 Mar. 1785.

⁸⁵ P.R.O. Adm. 51/876.

⁸⁶ P.R.O. Cust. 54/1 30 Dec. 1784.

⁸⁷ P.R.O. Adm. 1/2057, 27 Dec. 1784.

⁸⁸ West Suffolk Record Office, Grafton Papers, 423/804.

⁸⁹ David Jarrett, *Britain, 1688 to 1815*, 1965, p. 395.

⁹⁰ Williams, op. cit. p. 153.

⁹¹ P.R.O. WO 1/1027, 3 Mar. 1785.

⁹² P.R.O. WO 1/1029, 31 Jan. 24 Sept. 1786.

⁹³ P.R.O. WO/1029, 23 Dec. 1786.

⁹⁴ P.R.O. PRO 30/8/284, 23 Nov 1786. PRO 30/8/298 12 Feb. 1788. E. Carson, *The Ancient and Rightful Customs*, 1972, pp. 103–104.

⁹⁵ Williams, op. cit. pp. 161–162. See also, W.A. Cole, 'Trends in Eighteenth Century Smuggling', reprinted in, W.E. Minchinton, ed. *The Growth of English Overseas Trade*, 1969, p. 140.

Aspects of Capital Formation: Some Insights From North Somerset, 1750–1830

BRENDA BUCHANAN

The object of this paper is to point out some of the shortcomings in recent studies of capital formation and to indicate from work in a particular region how these weaknesses may be overcome.¹ These aims are based on the premise that the study of capital formation has both a measurable aspect, concerning the increase of capital stock over time, and a narrative dimension, concerning the explanation of the process by which capital formation has taken place.² Most previous studies have concentrated on the first element to the neglect of the second, and this narrowing of the subject has resulted in a loss to our understanding in both respects – to the quantitative aspect because this would benefit from a greater infusion of empirical evidence than it has so far been given, and to the study of the process of capital formation because this has hitherto received little attention. This over-emphasis on measurement is particularly regrettable for the crucial years of the British industrial revolution, as the documentary evidence for this period is too insubstantial to bear interpretation by a quantitative approach alone. It has recently been observed that in going back beyond the mid-nineteenth century, data limitations weaken the value of quantitative national accounting approaches relative to other methods.³

The paper begins with a review of general issues in order to indicate the inadequacies of the conventional approach to this subject, and from a survey of north Somerset 1750 to 1830 an interpretation of the *process* of capital formation will then be suggested. The emphasis is on the general framework and hence there are no tables of figures.

I

The process of capital formation is of acknowledged significance, for

as a recent analysis has pointed out, it is as important to ask how capital investment was motivated and financed as to know how much of the growth of output was attributable to such investment.⁴ Yet there have been no comprehensive answers to the first question. Well-funded investigations of Merseyside, and of the national economy through a project based at the University of Sheffield, have both produced only preliminary results.⁵ Smaller studies such as that by D.T. Jenkins on the West Riding, Ian Donnachie on Scottish brewing, and J.R. Ward on canal finance, have identified sources of capital but say little on the processes of its formation.⁶ Business historians seem primarily concerned with profits rather than with the composition of total capital employed.⁷ C.W. Chalklin and R.S. Neale have described the context of capital formation in building, but are limited to that industry and by their urban settings.⁸ Other studies on a regional basis are similarly restrictive, especially in concentrating on a post-1830 or even later period, because of data limitations.⁹ This suggests that although such deficiencies may be masked by statistical techniques, the availability of data determines the areas, periods, and sectors chosen in this field of research just as much as for the more traditional 'source-oriented' historians. A.G. Kenwood's study of north-eastern England exemplifies this point.¹⁰ C.H. Feinstein, although outstanding in his contribution to national aggregative analyses of capital stock, nevertheless excludes the savings and finance aspects and thereby ignores the *processes* of capital formation.¹¹

There is no lack of challenge in seeking to find out how capital was formed, and the matter is of importance to economic theory as well as to empirical economic history since it involves analyses of the flow of savings, the role of financial intermediaries, and the act of investment in the creation of capital assets. Conceptual problems arise less from the difficulty of importing ideas from the study of economics into the different discipline of history, than from the disparity between concept and evidence to be found in both fields. In economics this is indicated by the theoretical problems inherent in the measurement of capital, as well as in the more practical difficulties involved in the construction of estimates in developing countries. One eminent economist has remarked that 'it is of no use framing definitions more precise than the subject-matter to which they apply'¹² and a doyen in this field has stated that 'No *standard* definition of capital formation exists at present; and I doubt whether one is desirable now' for in the pursuit of 'different analytical purposes and problems' different definitions may be appropriate.¹³ This flexibility of approach is desirable in the historical context too, if the possibilities of develop-

ing our knowledge of the processes of capital formation are not to be constrained.

A definition of capital formation as:

Additions made during a particular period of time to the stock of goods which are for use in future production. These are both fixed assets, such as buildings, items of plant and so on, and work in progress, stocks of raw materials and finished goods.¹⁴

has been generally accepted by economic historians, rather than debated.¹⁵ However, if 'additions' can be taken to cover both measurement of capital incrementation *and* the processes by which it was made, then it is perhaps a useful definition and preferable to one substituting a more ambiguous term such as 'investment'.¹⁶

The pre-occupation of some economic historians with the application of the economists' skills of measurement at the macro-economic level, devising approximations and aggregates to overcome deficiencies of data, may account for the neglect of the process of capital formation. Kuznets defends the concentration on the national economy on the grounds that the sovereign state formulates policies,¹⁷ but historians are not for the most part concerned with producing analyses for policy making, and there are cases where the region is a much more appropriate and 'real' unit for the investigation of economic change. It may 'reveal critical relationships far more clearly than national studies'.¹⁸

The dangers of 'an excessively aggregative approach' have also been stressed, for:

With structural, sectoral and regional change being so pronounced during the early stages of industrialization . . . national aggregates and averages can be more than usually misleading.¹⁹

Not only may the national aggregates be misleading, but to employ capital formation as simply an aggregative concept is unacceptable. Despite widespread practice, aggregation is no necessary part of any recognized definition of capital formation: rather it is a chosen method, which has led to the neglect of alternative approaches.

Research into the process of capital formation requires a continuity of evidence which is often lacking. Stanley Chapman's study of cotton spinning in the east Midlands found sufficient documentation for an analysis of the financial structure of one firm, and even then for only thirteen continuous years.²⁰ These difficulties are widely acknowledged,²¹ and caution has been urged in the presentation of

findings which are based to some degree on 'conjecture and speculation'.²² Yet some historians have converted speculative conclusions into dogmatic assertions, as an example of which Feinstein has cited R.M. Hartwell's restatement of the findings of Deane and Cole on the movement of the investment ratio in the eighteenth century.²³ Even more serious is the insufficient distinction between historical and statistically derived 'facts' to be found for example in work on the ratio of investment to national income in the nineteenth century American economy. 'Dramatic increase' is claimed, but data pre-1840 is notoriously deficient on both increases in capital stock and the size of the national product.²⁴ Such studies demonstrate the need for more factual information, not only because the available data have been overstretched in the pursuit of national aggregates and the testing of hypotheses, but also to ensure that the concept of capital formation should not be confined within a narrow and restrictive interpretation which fails to take into account the historical dimensions of the subject.

II

The northern third of the old county of Somerset stretches from the southern edge of the Mendip hills northwards to the River Avon, and lies between the mouths of the Rivers Avon and Axe on the west coast and the towns of Bath and Frome on the east. Although the application of the term 'region' to this physical entity is fraught with difficulties it is not proposed to argue the case on this occasion, other than to say that the designation is not an arbitrary one for the area has both historic credibility and economic cohesion. It was defined by John Billingsley in the 1790s in his review of the county for the Board of Agriculture,²⁵ and although it had links with both the rest of Somerset and the port of Bristol (accorded county status in 1373), it remained separate from each.

Somerset had long been regarded by contemporaries as a rich and populous county.²⁶ Its wealth rested on agriculture and woollen textiles, to which must be added for the northern third, paper making, lead, calamine, stone and coal mining, and the flow of visitors to Bath. At the beginning of the eighteenth century it was one of only six English counties with an estimated population of more than 200,000. By 1831 this had risen to more than 400,000 and the county then ranked eighth.²⁷ More significant than these overall figures however was the density of population, and in this Somerset ranked second relative to other counties in 1700 and fourth in 1750,

although by 1801 it was ninth.²⁸ This loss of rank accords with estimations of migration and natural increase, which show that despite Somerset's doubling of population during this period there was a continuing loss by migration, particularly during the three decades after 1751.²⁹ The Census returns by parish show that 45 per cent of the county's population lived in the northern third in 1801, and 47 per cent in 1831.³⁰

Apart from the Mendips there was in the early eighteenth century a good scattering of villages in north Somerset, especially around Bath, described by Camden as 'a flourishing place, both for the woollen manufacture, and a great resort of strangers',³¹ and south of Bristol where the settlement had begun to assume a suburban aspect. Shepton Mallet, Frome, and the ecclesiastical centre of Wells were already established woollen textile towns. The development of coal mining centres such as Radstock and Midsomer Norton and leisure resorts such as Weston-super-Mare and Clevedon lay in the future. The growth of the former came in the second half of the eighteenth century, and of the latter in the early decades of the nineteenth century.³²

The stability of this long established settlement was unaffected for good or ill by the strong influence of any great noble families. Like the rest of the county the northern third was governed by a broadly based gentry whose manor houses were well distributed in the region, though not in the more inhospitable parts. Several of these families, like the Eltons of Clevedon Court, had their origins as Bristol merchants and maintained links with the city and its port. More rarely others, such as the Stracheys of Sutton Court, established a political and commercial base in London. Most of the gentry however, like the Moggs (later Rees Moggs) of Farrington Gurney, were content to function within the region, furthering both private and public interest through their activities as, for example, turnpike trustees, enclosure, and sewerage commissioners. The impact of the idea of progress and the spirit of improvement in such a society is difficult to determine, except in so far as such notions were institutionalized in bodies like the Bath and West Agricultural Society, founded in 1777 and widely supported as its membership lists and journals show.³³ The Society provided a forum for the gentry, clergy, and men of science and medicine, as well as activists such as John Billingsley who rose from humble dissenting origins to become a clothier, landowner, improving farmer, enclosure and sewerage commissioner, turnpike trustee, and canal and coal proprietor, as well as writing the report to the Board of Agriculture already mentioned.

Important though it was, this growth of amateur, gentlemanly concern would have been ineffective without a parallel development of professional expertise. Surveyors and engineers were of growing importance towards the end of the eighteenth century, but even more important and from an earlier date were the attorneys, for their role in the process of capital formation was crucial. Perhaps due largely to its earlier wealth, and to the tradition of settled, orderly development, there was in the county by the second half of the eighteenth century a body of lawyers sufficiently numerous to meet the increasing demand for their legal services, and with enough professional awareness to form two of the earliest provincial law societies.³⁴

Any claims as to the appropriateness and value of an historical approach to the study of capital formation in a region such as this must now be tempered by an acknowledgement of the difficulties involved, and here three constraints must be mentioned. The first relates to timing, for it is only from the mid-eighteenth century that there begins that accumulation and continuity of primary evidence which has been judged essential for a sustained analysis of capital formation. But although the period of detailed research has been influenced by this practical requirement, the signs of an earlier economic activity may nevertheless be found amongst the later material. For example, although the annual balance sheets of the Woolley gunpowder mills are available for analysis only from the later 1740s, partnership agreements show that the works were founded in the 1720s.³⁵ Similar indications for other manufacturing and mining concerns suggest the importance of the 1720s and 1730s in this region, especially as these years saw also the founding of the Bristol Turnpike Trust (1727), and the construction of a tramway (1731) for the transport of Bath stone to the newly navigable River Avon (1727).³⁶ Indeed, although there is insufficient evidence to study these decades in detail, the founding of these ventures in a relatively stable society with a functioning legal system and security of property, and a considerable degree of craftsmanship and specialization, suggests that by the early decades of the eighteenth century this region had reached a stage of readiness for more rapid economic development. This responsive environment may then have encouraged further change by providing both an expectation of growth and a context within which it could take place, for there was in north Somerset none of that ample endowment with natural resources which stimulated the development of some other regions.

The second constraint relates to the range of evidence available, for this is inevitably limited by special circumstances. Thus primary sources may have survived because they were of an institutional

nature (the papers of turnpike trusts, improvement commissioners), because they constituted a legal claim or title to land (enclosure awards), because they authorised the collection of a rate (drainage commissions), or because they had been filed with family or estate papers (mining and manufacturing concerns). Not only does this mean that the detailed and continuous evidence being sought has rarely survived for significant areas such as residential building, routine agricultural investment, and many manufacturing concerns, but also that even amongst the most fruitful sources such material is unlikely to be comprehensively available. For example, although the papers of the Bath Turnpike Trust have been well-preserved since the renewal Act of 1757, almost nothing survives for the neighbouring Bristol Trust before the official returns of the 1820s and 1830s. To some extent these difficulties can be eased by reference to secondary sources, but there remains a great problem of assimilation, of judging the weight of generalization which can be borne by the possibly untypical evidence. However these problems may be no greater than those of the aggregation of data on a statistical basis, and there are even certain advantages, for the precision of the particular is not lost within the aggregative whole, and the extent of the generalization is likely to remain clear.

Thirdly, much of the material which does survive is often not in a form capable of yielding easily the kind of information being sought. This problem may be illustrated by reference to the financing of enclosures, and of the turnpike trusts. Evidence on the former seemed to be entirely lacking for this region, for in only one case was an enclosure award accompanied by commissioners' accounts, and very little extra-award material survives. But a close study of the awards has shown that in almost all cases the enclosure was financed by the sale of land, the recorded details of which include the capital sum thus raised. It may seem a sleight of hand to transmute this land transaction into a capital investment, but when allowance has been made for administrative costs the expenditure of the sum remaining served to extend the capacity of the commons and waste lands in terms of space and time. In the one case for which a full and orthodox financial account is available, the capital sum raised by land sale tallies exactly with that spent on the enclosure.³⁷

The documents put to fresh use for the turnpike roads are the mortgage deeds of the Bath Trust. These have survived because when paid up they were stored by the clerks to the Trust, in bundles according to their final ownership. These collections can be unravelled, for each individual deed carries details of the initial transaction on its face, with all subsequent changes of hand in what may be

regarded as a secondary market, recorded as endorsements. Again there is the problem of administrative costs, as well as the matter of repairs as opposed to new works, but because the mortgage deeds show when capital sums were actually raised and not merely when they were authorised, this material provides evidence of investment in the roads which is more satisfactory than that derived from Acts of Parliament. The understanding of investment decisions is enhanced by evidence from the minute books.³⁸

These examples have a two-fold interest, for not only do they show how unpromising material may yield significant information, they also suggest that regional evidence may open to question some accepted generalizations on a subject. Thus the evidence from north Somerset challenges the view of some modern agricultural historians that enclosures were rarely financed by land sale. It also raises the possibility that waste land enclosure costs were high because large capital sums could be raised more easily by land auction than by the imposition of a rate, and not simply because of topographical problems as is generally thought.³⁹ In the case of the turnpike roads, the foundation of Feinstein's aggregates is acknowledged to be the work of J.E. Ginarlis, whose estimates are based on a backward extrapolation from the 1820s with guidance from a number of trusts for which details of expenditure are available. The crucial assumption behind this procedure is 'that trust mileages had remained constant over the period 1750-1822 and that expenditure patterns similar in the 1820s did not change from 1750'.⁴⁰ But this ignores the significance of the renewal Acts. The Wells Turnpike Trust is included in the sample through which Ginarlis justifies this assumption yet its mileage rose from 26.25 to 37.0 miles in those years. This was not unusual, for that of the Bath Trust more than doubled in the same period, from 20.15 to 48.47 miles.⁴¹ The fact that no turnpike network in this region emerged fully-fledged in the year of its inception has important implications for the continuing construction of new and amended roads.

The value of this factual, historical evidence is more than that of a corrective to generalizations and aggregations at the national level however, for despite the constraints of the primary material there are several ways in which it can make a positive contribution to the understanding of the process of capital formation. First, the relationship between the sources of capital, the mechanisms by which funds were channelled into capital projects, and the particular form and structure of the assets thus created may be identified. Second, any archival material capable of providing a continuity of evidence on the financing of individual undertakings in the major sectors of the

regional economy may be retrieved and reconstituted, and then analysed in order to measure such features as the increase in physical stock, the costs involved in the creation of fixed assets and their distribution, the relationship between fixed and circulating capital, and the returns to productive investment. Such an approach, it may be noted, overcomes the narrow concern of aggregative studies with fixed capital alone. Third, the relationship between capital investment and the overall pattern of economic change may be explored as a matter of importance for the region itself, and as a basis for comparative analysis, though this exercise is handicapped by the lack of similar studies for other regions in these years.

III

Several generalizations in support of these three contentions may be drawn from a study of this subject in north Somerset, though the detailed evidence on which they are based lies beyond the scope or intention of this article. On the first matter, although the 'plentifulness' of capital and the range of investment opportunities were both important, the existence of specific outlets for capital from particular sources was of greater practical significance. These linkages were largely shaped by the legal provisions authorizing different undertakings. Some were quite specific so that, as already noted, parliamentary enclosure was financed by the compulsory sale of land. Others allowed for the channelling of small savings into particular outlets, through for example the risk-free and marketable institutional mortgages offered by the turnpike trustees and improvement commissioners. The importance of this linkage may be seen from the fact that although those who managed these public bodies (eg the gentry, coalmasters) gave readily of their time they rarely made a financial investment, perhaps because unlike the small urban savers (eg upholsterers, lodging house keepers) they had better alternative uses for their funds.⁴² The linkages offered by the agreements under which mining and manufacturing partnerships operated were flexible, but no less important. The interlocking partnerships of the coal proprietors for example allowed the costs of new ventures to be offset by the profits of established pits, and it may have been the failure of the free lead and calamine miners to develop such supportive networks which left them unable to come to terms with their capital requirements, especially in the matter of drainage.⁴³ The woollen industry in contrast was dominated by independent, often large-scale clothiers, able to meet their capital needs from within the industry

chiefly because of its long-standing importance in the countryside, especially in the eastern part of the region where it flourished as part of the larger West of England cloth industry, and its well-established trading patterns.⁴⁴

The importance of creating appropriate legal entities for the handling of funds and the formation of assets must also be noted. The sewerage commissioners for example were repeatedly reassured by counsel that their powers extended to the undertaking of comprehensive new drainage schemes, but they declined to put this opinion to the test because they feared that the creation of new works towards which proprietors had no traditional obligations might jeopardise their personal finances. An Act of Parliament authorising a separate body of commissioners to finance and execute the new work had therefore to be obtained in each case.⁴⁵ The commissioners of sewers evidently felt themselves less well-protected than others such as turnpike trustees and enclosure commissioners, who were similarly involved in public capital investment but without the fear of private assets being placed at risk. Of course the view as to what constituted an appropriate legal entity might change over time. Thus the pre-Bubble Act unincorporated joint stock Bristol Brass Company with its several branches in north Somerset was thought to have become so unwieldy by the 1780s that it was re-formed as a partnership. This move was made possible by the fact that the funds previously recruited from a large body of shareholders had become available from other sources, namely the Harford merchant family of Bristol, and the Bristol Fire Office.⁴⁶

Further, because the pattern of linkages here described constituted an imperfect capital market, this would seem to be unfruitful ground in which to look for movements between for example agricultural profits and transport investment. It can be shown that individuals took advantage of opportunities which would bring them practical benefits as well as financial returns, as when some coal masters invested in the coal canal.⁴⁷ But although evidence is limited it appears that changes in financial returns alone were not always enough to attract funds from other uses. Thus, although the continuing investment in coal mining, canals, and enclosures in the 1790s suggests there was then no overall shortage of capital, yet savings were not forthcoming for the Bath Turnpike Trust in the years after 1793 until 1801, despite the raising of the rate offered from 4.0 per cent to 4.5 per cent in 1793 and to 5.0 per cent in 1797.⁴⁸ The situation with regard to several manufacturing concerns in the region was more open, chiefly because of the interest of the Bristol merchant community in this outlet for surplus funds, and the network of

personal and institutional contacts through which long-term capital investments could be made. Short-term finance was also important as it allowed for considerable mobility of funds. Of the sum of nearly £80,000 borrowed in the course of the 1760s by a copper company working on five sites in north Somerset for example, one-third of the loans came from banks and were held for an average of 4½ months, and two-thirds came from other Bristol sources (mainly merchants, tradesmen, and women) and were held for an average of 4 years.⁴⁹

Reference must also be made to the activities of attorneys in the process of capital formation. Their importance rested in general upon the devising of an appropriate legal framework within which bodies could operate, and in particular upon the development of financial instruments through which savings could be channelled. The raising of funds on the security of land was a long-established method of easing financial constraints, but even when this was extended to land containing paper mills or coal mines, it is likely that these transactions continued to take place within a personal market in which attorneys matched the needs of their different clients.⁵⁰ But from at least the mid-eighteenth century the importance of attorneys in north Somerset extended beyond this role, for they actively promoted the growth of an impersonal capital market. This was achieved through what will here be described as the institutional mortgage, by which as a result of advertisements on turnpike gates and later in newspapers, funds were recruited from unknown clients for investment in public utilities. There were two important consequences of this development: it facilitated the building up of the infrastructure of the region, most notably the road system, and it promoted the growth of a local securities market for these financial instruments were in small easily sold units. The volume of such transactions (in 1764 mortgage deeds of the Bath Trust to the value of £5,850 were re-sold, representing nearly 50 per cent of the total mortgage debt of £12,000), and the number of deeds held for only short periods, suggest that this financial market may have performed a quasi-banking function.⁵¹

On the second question, some tentative generalizations may be made despite the difficulty of achieving a breadth and continuity of evidence on the increase of capital stock in the region. For example, investment in the turnpike roads was most active in the three decades after 1750 and again in the 1820s and 1830s. With some exceptions due to the circumstances of individual trusts it remained low in the intervening years, although from the 1790s the rate of investment in agriculture (through enclosures, drainage, and farm making) and in canals was increasing. A continuing low rate of increase of capital stock in mining and manufacture indicates the small annual incre-

ments through which such activity could be maintained. The relationship between fixed and circulating capital can be satisfactorily studied for the manufacturing concerns only, but here some interesting evidence emerges. The organization of the woollen cloth industry on a putting-out basis, especially before the introduction of spinning mills from the 1790s, suggests that circulating capital was likely to have an importance relative to fixed capital which would distinguish this form of manufacture from others in the region. But such a generalization is difficult to sustain because these proportions varied so greatly in the more integrated undertakings. Thus at the brass and copper works raw material stocks were generally high, so that at the former in the years 1779–84, fixed capital represented only 12 per cent of the combined assets. Yet at the gunpowder works, which had to carry large stocks because of the importance of its foreign suppliers and customers, this proportion was more nearly 40 per cent. Perhaps the fixed capital embodied in water-powered mills was of greater significance relative to circulating capital than has generally been thought, and if this was the case for the powder mills it was probably even more true for the grain and paper mills of the region with their more local trading networks.

An investigation of the profitability of the capital employed prompts the question of whether there was some optimal point in the relationship between fixed capital and stocks which was most likely to promote an efficient use of the physical assets. Evidence is limited, and enterprises are in any case likely to have had different 'ideal' positions because of variations in the cost and supply of raw materials and in conditions of sale. Nevertheless it is possible to suggest tentatively that when fixed capital was 20 per cent to 25 per cent of the total inventory assets (as at the re-formed Bristol Brass Company, after the new partners had taken immediate steps to slim down stocks in the late 1780s), then this was a proportion likely to promote efficiency as judged by the profitability of the capital employed.

Third, there is the matter of the relationship between capital formation and economic change. The pattern which emerges from the evidence on north Somerset is that of two levels of economic activity in these years : first, the general internal developments which may be termed land- or resource-based, and second, the externally financed manufacturing enclaves which may be termed capital- or trade-based. The former include the enclosure, drainage, coal mining, river, canal, and road transport undertakings, all related to local needs and mostly financed from within the region. On the whole these were large in structure, but the capital input was either built up slowly (mining and farm making), compiled from small separate

contributions (turnpike mortgages, canal shares, drainage rates), or even realised by the sale of assets (enclosures). Although one of these spheres of investment (agriculture) was perhaps as profitable as those at the second level, and another (the coal canal) was certainly so, returns were generally lower because of the need to offset gains by losses (mining), and through the limits on the institutional rate (turnpike trusts and improvement commission). There is no evidence that banks played a role of any importance in these undertakings until the early decades of the nineteenth century. Loans enabling enclosure schemes to get underway came from local gentry, and turnpike finances were handled by trustees (eg a wine merchant). There was a network of local suppliers (eg of candles and gunpowder for the coalmines), but there is no evidence that credit was an important factor in their operation, and indeed surviving accounts show the regular settlements of debts. This may have been because the undertakings in this first group were labour rather than capital intensive, and although the end product was a significant item of fixed capital (a mine or a new road) there was a long period of construction during which wages and other small payments had to be made.

The manufacturing ventures at the second level of economic activity (gunpowder, copper, brass, and glass making) were not themselves necessarily large in scale, but they were part of an extensive network of foreign and coast-wise trade, credit facilities, merchant capital and banking support, centring on the port of Bristol. To the merchants of that city, north Somerset offered scope for investment and expansion on accessible, water-powered rural sites. There were of course other, longer-established manufacturing concerns in the region (woollen textiles, paper making, brewing, distilling, and iron founding), but apart from the first these are to be classified with resource-based developments, using local capital and supplying largely local customers, rather than as part of Bristol's shipping and credit network. It is unfortunate that there is little surviving evidence about them to suggest exceptions to this generalization, but perhaps the very fact that the records of local paper makers or iron masters were less likely to survive than those kept 'ship-shape and Bristol fashion' by entrepreneurs engaged in a wide range of ventures, may serve as a further indication of the distinction here being drawn. In the case of the woollen industry classification is more difficult, but to regard it as capital- or trade- rather than resource-based would seem appropriate. This is because although in the period under consideration English wool was still widely used, and the home market was gaining an increasing precedence, yet foreign (chiefly Spanish) wool continued to be of great importance in

a system of manufacture which was enmeshed within a network of international trade, and which was controlled by capitalist clothiers through their financing of both the domestic and factory stages of production. Indeed the fact that in the mid-fourteenth century this industry began to move from its manufacturing and trading base in the port of Bristol, into the countryside in search of water power and a freedom from restrictions, makes it a forerunner of the pattern here being described for later years.

Two areas have received less attention than they deserve in this analysis : general investment in agriculture, and residential building. In both cases primary evidence is hard to come by. However, nothing in the secondary literature on farming conflicts with the observations already made about the financing of land-based developments from within the region, whilst Somerset's earlier high ranking in terms of population numbers and density, and the later absence of great industrial concentrations, combine to suggest that the growing population may have been housed within the existing stock or in small locally financed housing developments (eg housing for miners). Because larger-scale projects were also developed on local initiative (eg at Weston-super-Mare by the Smyth-Piggots and Clevedon by the Eltons), then residential building may in general be accommodated within the proposed analysis. There remains the problem of Bath, where the importance of aristocratic entrepreneurs like the Duke of Chandos and the Earl of Bath, and of the great web of credit involving builders, attorneys, and bankers, has now been revealed by Chalklin and Neale. The wealth of detail in the latter's recent book makes it difficult to retain a sense of perspective about the city, but it is necessary to do so because when viewed in its regional setting Georgian Bath seems to have been as detached from the life of north Somerset in the eighteenth century as is the esoteric Bath Festival from the generality of local life to-day. It provided a market for local produce (food, coal, stone) but undertook little reciprocal investment in the region. Yet despite this detachment, from the point of view of this investigation its buildings may be seen as land-based, but financed from the metropolis as well as from within the city itself.

In seeking reasons for the presence of trade-based manufacturing enclaves in north Somerset it may not be necessary to look beyond the difficulties of industrial expansion in Bristol and the opportunities provided by rural locations and a growing population. But it is of interest to consider other factors which may have influenced both the nature of this investment and its timing. The lack of interest by clothiers in ventures distinct from the textile trade⁵² may be explained by the long stagnation of the woollen industry from the 1720s

to the 1760s,⁵³ but the development of the Bristol interest in these years is less easily accounted for unless an explanation is sought in peculiar factors outside the traditional pattern of commerce. Perhaps the most important of these was Bristol's involvement in the slave trade, in which it was the leading English port from the 1720s to the early 1740s. It is not intended to embark upon the vexed question of slave trade profits, other than to note that their scaling down by Roger Anstey was based on evidence from the second part of the eighteenth century and not from the period of Bristol's dominance.⁵⁴ To concentrate on these profits alone would be in any case to proceed on too narrow a front, for as well as providing Bristol merchants with surplus funds, the Africa trade also stimulated economic development by the market it offered for manufactured goods. Accounts, inventories, and correspondence all provide evidence of production for this special market, for example in the distinction made between Guinea powder for the Africa trade and Merchant powder for other customers, as well as in the manufacture of such barter goods as 'monelas' of copper and 'Guinea rods' of brass.⁵⁵ It may be argued that under this stimulus there developed an interlocking network of interests involving the port of Bristol, the Africa trade, the trans-Atlantic plantations, and the manufacturing ventures of the region, in a relationship which was largely dependent upon that city for the provision of capital and credit, transport, raw materials and markets.⁵⁶

IV

In conclusion, what was the influence of the two levels of capital formation on the course of economic change in the region? It is only possible to suggest an explanation, but it may be that the effect of the trade-based undertakings was first to help stimulate but then to retard the course of development. As has been noted, many of the essential pre-conditions for growth were present in north Somerset in the first half of the eighteenth century – a settled social and economic framework in a traditionally wealthy and populous county, a growing domestic market, access to a major port offering trading and credit facilities, an active body of lawyers, and a large number of gentlemen willing to combine public duty with private interest. In this situation the enterprises financed by merchant capital are likely to have been for much of the eighteenth century an additional factor for change, perhaps stimulating the development of an infrastructure, especially a road network, greater than was otherwise warranted. The quicken-

ing of economic activity was however chiefly in traditional areas such as agriculture, mining and transport, and with the failure of the trade-based industries to develop backward and forward linkages, the decline of the land-based industries such as paper making, and the lack of great natural resources, north Somerset never achieved the self-sustaining growth of another region of Bristol activity, south Wales. This last reference suggests that it was not the Bristol link as such which came to inhibit development but rather the fact that the manufacturing ventures remained a part of the merchanting network instead of becoming agents of industrialization.

The contribution of the woollen industry is here of particular interest, since in the terms of the current debate on proto-industrialization, the taking up of slack rural labour by putting-out clothiers producing for external markets in a region of increasingly commercialized agriculture, could have helped foster the transition from a traditional rural culture to a factory-based industrial society.⁵⁷ Indeed, this change came close to realization, for despite the often violently expressed opposition of workers to the introduction of machinery from the 1770s on, there was a growing concentration of production in water- and later steam-powered factories on the eastern edge of the region, especially from the 1790s in Frome, Shepton Mallet, and Twerton now a suburb of Bath. But although some individual concerns continued to flourish, the industry in general declined in the nineteenth century in the face of foreign and regional competition. The reasons for this are difficult to determine but they may be summarised as a deficiency of entrepreneurship, whether this was manifested as a failure to persist with the introduction of machinery before the 1790s, as an inability to secure the improved forms of transport which could have brought coal from the nearby coalfield, or through inadequate marketing in the face of determined salesmanship by the men of the West Riding of Yorkshire.⁵⁸ However this decline should be seen not only in contrast to the success of outside competitors, but also in relation to the general fortunes of the region. In that context the woollen industry may be seen as part of the pattern whereby the manufacturing enclaves re-inforced rather than challenged the traditional society which therefore failed to undergo the structural changes necessary for sustained economic growth. The result was that most of the manufacturing undertakings petered out in the course of the nineteenth century and the region reverted to its land- or resource-based economy, largely agriculture, coal mining, and quarrying.

As an example of capital formation in a regional economy therefore, north Somerset cannot be counted a success story. Nevertheless

a study of the growth experience of the region is important, because it is part of the kaleidoscope of change making up the shifting pattern of the national economy, and because it touches upon several themes of current interest in economic history. These include proto-industrialization and economic retardation, both of which are illuminated by the experience of north Somerset. Even more important than these justifications however, it is the thesis of this article that the subject of capital formation can only be fully understood within the context of the historical dimension as revealed by empirical studies. The significance of this method goes deeper than the provision of illustrative details, for through the exercise of an historical approach (in particular, the reconstitution of data on investment in capital stock, and the identification of the procedures by which this took place), the basis of some of the accepted generalizations on capital formation may be questioned, and the process itself may be analysed and explained. Moreover, as the statistical evidence for the British industrial revolution is too insubstantial to be interpreted by the quantitative method alone, it is impossible to explore the subject of capital formation in this period in a meaningful manner except by a greater reliance on detailed historical research of the sort described in this paper. It is accepted that there are disadvantages to this method, such as the difficulty of investigating the investment ratio on a regional basis, but against this must be set the many advantages stemming from a broad concern with the whole matrix of capital formation rather than with a restrictive concentration on the measurement of its sometimes conjectural parts.⁵⁹ Not least, this integrated approach to the subject should lead to an improvement in the conceptual understanding of and the theoretical approach to the whole matter of capital formation.

Notes

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² The case for narrative history has been forcibly re-stated by B.E. Supple, 'Economic History in the 1980s: Old Problems and New Directions', *Journal of Inter-disciplinary History*, XII (1981), pp. 204-5.

³ R.C.O. Matthews, C.H. Feinstein & J.C. Odling-Smee, *British Economic Growth 1856-1973* (Oxford, 1982), p. 5.

⁴ Robert M. Solow & Peter Temin, 'Introduction: The Inputs for Growth', in Peter Mathias & M.M. Postan, eds. *Cambridge Economic History of Europe*, VII, pt.1 (Cambridge, 1978), p. 27 (hereafter C.E.H.E.).

⁵ J.R. Harris, P.L. Cottrell & B.L. Anderson, *The Supply of Capital and the Economic Development of Merseyside 1690-1880* (HR 754), Social Science Research Council (hereafter S.S.R.C.), *Newsletter*, 33 (1977); J.P.P. Higgins & Sidney Pollard, eds. *Aspects of Capital Investment in Great Britain 1750-1850: A Preliminary Survey* (1971).

⁶ D.T. Jenkins, *The West Riding Wool Textile Industry, 1770-1835: A Study of Fixed Capital Formation* (Edington, 1975); Ian Donnachie, 'Sources of Capital and Capitalization in the Scottish Brewing Industry, c. 1750-1830', *Economic History Review*, 2nd ser. XXX (1977), pp. 269-83; J.R. Ward, *The Finance of Canal Building in Eighteenth-Century England* (Oxford, 1974); see also Lorna Weatherill, 'Capital and Credit in the Pottery Industry Before 1770', *Business History*, XXIV (1982), pp. 243-58.

⁷ See for example the statistical appendix in B.W.E. Alford, W.D. & H.O. Wills & the Development of the U.K. Tobacco Industry 1786-1965 (1973), pp. 464-71.

⁸ C.W. Chalklin, *The Provincial Towns of Georgian England: A Study of the Building Process 1740-1820* (1974); R.S. Neale, *Bath 1680-1850, A Social History: Or a Valley of Pleasure yet a Sink of Iniquity* (1981).

⁹ For example, A.G. Kenwood, 'Fixed Capital Formation on Merseyside, 1800-1913', *Econ. Hist. Rev.*, 2nd ser. XXXI (1978), pp. 214-37, which is misleadingly entitled for this study is limited largely to construction activity in the years from 1838, and contains little reference to the sources of capital or the mode of its employment.

¹⁰ A.G. Kenwood, 'Capital Investment in North Eastern England, 1800-1913' (unpublished Ph.D. thesis, University of London, 1962), in which the choice of region was influenced by the availability of quantitative material for particular economic sectors, p. 20.

¹¹ C.H. Feinstein, 'Capital Formation in Great Britain' in C.E.H.E. pt. 1, p. 29 & n.3, where the reader is referred to Francois Crouzet's discussion of the supply of capital in his editorial introduction to *Capital Formation in the Industrial Revolution* (1972), pp. 39-64. But although a useful guide to earlier research this essay cannot be regarded as providing a full consideration of the matter.

¹² Joan Robinson, *The Accumulation of Capital* (1956), p. viii.

¹³ Simon Kuznets, 'International Differences in Capital Formation and Financing', in National Bureau of Economic Research, *Capital Formation and Economic Growth*, vol. 19 (Princeton, 1955), pp. 19-25.

¹⁴ J. Hibbert, 'Modern Practices and Conventions in Measuring Capital Formation in the National Accounts', in Higgins & Pollard, eds. *Aspects of Capital Investment*, p. 11.

¹⁵ Crouzet, *Capital Formation*, p.1 n.1. This definition is here relegated to a footnote, and there is a lack of discussion of conceptual problems in the volume as a whole.

¹⁶ The hazards of terminology have been set out in official publications of the United Nations, *Concepts and Definitions of Capital Formation* (New York, 1953), p. 7 and the Central Statistical Office, R. Maurice, ed. *National Accounts Statistics: Sources and Methods* (1968), p. 360.

¹⁷ Simon Kuznets, *Quantitative Economic Research: Trends and Problems* (New York, 1972), pp. 1-7.

- ¹⁸ S.S.R.C., *Research in Economic and Social History* (1971), p. 11.
- ¹⁹ Ibid. pp. 10–11.
- ²⁰ Stanley D. Chapman, *The Early Factory Masters* (Newton Abbot, 1967), p. 125.
- ²¹ Phyllis Deane, 'Capital Formation in Britain before the Railway Age', in Crouzet, ed. *Capital Formation*, p. 95; Sidney Pollard, 'The Growth and Distribution of Capital in Great Britain, c. 1770–1870', *Third International Conference of Economic History*, I (1965), p. 362. See also Crouzet, ed. *Capital Formation*, p. 64.
- ²² Feinstein, in *C.E.H.E.* pt. 1, p. 28; Feinstein, in Roderick Floud & Donald McCloskey, eds. *The Economic History of Britain since 1700* (Cambridge, 1981), I, p. 129.
- ²³ Feinstein, in *C.E.H.E.* pt. 1, p. 90 & n. 225.
- ²⁴ Lance E. Davis & Robert E. Gallman, 'Capital Formation in the United States during the Nineteenth Century', in *C.E.H.E.* pt. 2, pp. 1–69.
- ²⁵ John Billingsley, *General View of the Agriculture of the County of Somerset, Drawn up in the Year 1795* (Bath, 1797), p. 16.
- ²⁶ Thomas Garden Barnes, *Somerset 1625–1640: A County's Government During the 'Personal Rule'* (Oxford, 1961), pp. 1–17. For general background see R.W. Dunning, *A History of Somerset* (Bridgwater, 1978) and *Somerset and Avon* (Edinburgh, 1980); for an examination of the characteristics which encouraged and maintained a high degree of social cohesion and order in the county see S.C. Pole, 'Crime, Society and Law Enforcement in Hanoverian Somerset' (unpublished Ph.D. thesis, University of Cambridge, 1983).
- ²⁷ Phyllis Deane & W.A. Cole, *British Economic Growth 1688–1959: Trends and Structure* (Cambridge, 2nd edn. 1967), p. 103, Tab. 24.
- ²⁸ E.K.C. Gonner, 'The Population of England in the Eighteenth Century', *Jnl. Roy. Stat. Soc.*, LXXVI (1913), pp. 261–96.
- ²⁹ Deane & Cole, *British Economic Growth*, pp. 108–09, Tab. 25.
- ³⁰ *Victoria History of the County of Somerset*, II (1911), pp. 338–52.
- ³¹ William Camden, *Britannia*, I (3rd edn. 1753), p. 90.
- ³² J.F. Davis, 'The Forest of Dean and Bristol and Somerset Coalfields' (unpublished Ph.D. thesis, University of London, 1959); Bryan Brown, 'A Survey of the Development of the Leisure Industries of the Bristol Region' (unpublished Ph.D. thesis, University of Bath, 1971). Also, Stephen Jackson, 'Population and Change: A Study of the Spatial Variations in Population Growth in North East Somerset and West Wiltshire 1701–1800' (unpublished Ph.D. thesis, University of Liverpool, 1979).
- ³³ Kenneth Hudson, 'The Membership of the Bath & West Society During its First 200 Years', *Acta Musaeorum Agriculturae*, XII (1978) pp. 50–6.
- ³⁴ Bristol Law Society, *The First Two Hundred Years* (Bristol, 1970); Robert Robson, *The Attorney in Eighteenth Century England* (Cambridge, 1959), pp. 36–8, 166–7, Appendix IV.
- ³⁵ B.J. Buchanan, 'A Comment on the Manufacture of Black Powder', *Journal of the Society for Industrial Archaeology*, 2 (University of West Virginia, 1976), pp. 75–80; B.J. Buchanan & M.T. Tucker, 'The Manufacture of Gunpowder: A Study of the Documentary and Physical Evidence Relating to the Woolley Powder Works near Bath', *Industrial Archaeology Review*, 5 (1981), pp. 185–202.
- ³⁶ Arthur Elton, 'The Pre-history of Railways, with Special Reference to the Early Quarry Railways of North Somerset', *Proceedings of the Somersetshire Archaeological & Natural History Society*, 107 (1963), pp. 31–59; Kenneth R. Clew, 'The Avon Navigation 1712–96' in *The Kennet & Avon Canal* (Newton Abbot, 1968), pp. 15–23.
- ³⁷ B.J. Buchanan, 'The Financing of Parliamentary Waste Land Enclosure: Some

Evidence from North Somerset, 1770–1830', *Agricultural History Review*, 30 (1982), pp. 112–26.

³⁸ B.J. Buchanan, 'The Evolution of the English Turnpike Trusts: Lessons from a Case Study', *Econ. Hist. Rev.*, 2nd ser. xxxix (1986), pp. 223–43.

³⁹ Buchanan, 'Financing Parliamentary Waste Land Enclosure', pp. 112–7.

⁴⁰ Feinstein, *C.E.H.E.* pt. 1, pp. 59–60; J.E. Ginarlis, 'Road and Waterway Investment in Britain, 1750–1850' (unpublished Ph.D. thesis, University of Sheffield, 1970), p. 103.

⁴¹ S.R.O. D/T/wel, Wells Turnpike Trust; D/T/ba, Bath Turnpike Trust. Parliamentary Papers containing details of turnpike trust mileages are cited misleadingly by Ginarlis as P.P. 1820, IV and P.P. 1833, H.o.L. Vol. X, B.M. (Ginarlis, thesis, p. 102 n.2). I should like to thank Mr D.J. Johnson, Deputy Clerk of the Records of the House of Lords Record Office for his help in identifying these papers as: H.L.R.O., H.C. 1821 (747) iv, p. 343 *et seq.*, *Report from the Select Committee appointed to consider the Acts now in force regarding Turnpike Roads and Highways in England and Wales, and the Abstract of Returns from Turnpike Road Trusts* and H.L.R.O., H.L. 1833 (81 & 24) cccxxiii, p.1 *et seq.*, *Reports of the House of Lords Select Committee to examine the Turnpike Returns now upon the Table and the Abstract of Returns from Turnpike Road Trusts for the year 1829*.

⁴² Buchanan, 'Turnpike Roads'; S.R.O. D/T/ba, Bath Turnpike Trust; B.G.A. Papers of the Bath Improvement Commissioners.

⁴³ S.R.O. Papers of the Beauchamp, Gore Langton, Hippisley, Hylton, Mogg, Popham, Rees Mogg, Samborne, Strachey, and Waldegrave families, and of Messrs. Foster of Wells, solicitors; B.A.O. Lovell Papers.

⁴⁴ This industry has been well-served by its historians. See K.G. Ponting, *A History of the West of England Cloth Industry* (1957); J. de L. Mann, *The Cloth Industry in the West of England from 1640 to 1880* (Oxford, 1971); N.B. Harte & K.G. Ponting, eds. *Textile History and Economic History, Essays in Honour of Miss Julia de Lacy Mann* (Manchester, 1973); K.H. Rogers, *Wiltshire and Somerset Woollen Mills* (Edington, 1976).

⁴⁵ S.R.O. D/RA Somerset River Board Papers: AD 1–6, Axe Drainage & SW 1–18, Congresbury & Weston Drainage; B.A.O. Sturge Papers, 32395 & 25642.

⁴⁶ B.A.O. Harford Papers, 28048.

⁴⁷ S.R.O. Papers relating to the Somerset coalfield and coal canal. Also, John A. Bulley, 'To Mendip for Coal: A Study of the Somersetshire Coalfield before 1830', *Proc. Som. Arch. Nat. Hist. Soc.*, 97 (1953), pp. 46–78 & 98 (1955), pp. 17–54; Kenneth R. Clew, *The Somersetshire Coal Canal and Railways* (Newton Abbot, 1970).

⁴⁸ S.R.O. D/T/ba, Vol. 9, 6 July 1793 and 7 January 1797.

⁴⁹ Bristol Public Reference Library, 'The Committee Book . . . of the Joseph Percival and Copper Company', B4771.

⁵⁰ B.L. Anderson, 'The Attorney and the Early Capital Market in Lancashire' in Crouzet, ed. *Capital Formation*, pp. 223–55; M. Miles, 'The Money Market and the Early Industrial Revolution: The Evidence from West Riding Attorneys, c. 1750–1800', *Business History*, XXIII (1981), pp. 127–46.

⁵¹ Buchanan, 'Turnpike Roads', p. 238.

⁵² S.D. Chapman, 'Industrial Capital before the Industrial Revolution: an Analysis of the Assets of a Thousand Textile Entrepreneurs c. 1730–50' in Harte & Ponting, eds. *Textile History*, pp. 113–37, argues that in those years it was relatively easy to transfer capital to other industries since a high proportion of assets were maintained in liquid form and fixed capital was non-specific. But examples are limited to maltings, the retail trade, inns and property.

⁵³ Mann, *The Cloth Industry*, pp. 37–8.

⁵⁴ Roger Anstey, *The Atlantic Slave Trade and British Abolition, 1760–1810* (1975), pp. 38–48.

⁵⁵ On the voyage of the *Bristol Merchant*, 1747–8, these goods made up more than one-quarter of the barter cargo with which the ship's master was instructed to purchase Negroes at Bonny in the Bite of Africa. After their sale in Jamaica he was to load the ship for Bristol with a cargo including 'some good Cotton to Stow Between the Decks'. I am indebted to Mr Frank Strahan, Archivist of the University of Melbourne, for drawing my attention to the Bright Papers, in Vol. VI of which this item appears.

⁵⁶ Studies of the French port of Nantes (Pierre M. Boulle, 'Slave Trade, Commercial Organization and Industrial Growth in Eighteenth Century Nantes', *Revue Française d'Histoire d'Outre-Mer*, LIX (1972), pp. 70–112, referred to by Anstey, *Atlantic Slave Trade*, pp. 50–7) suggest a similar industrial development in that area between 1730 and the mid-1750s, when it was curtailed by wartime setbacks to trade. The question of this stimulus to industrial development was earlier raised by Eric Williams, *Capitalism and Slavery* (North Carolina, 1944), pp. 65–84.

⁵⁷ For recent critical reviews of this concept see D.C. Coleman, 'Proto-Industrialization: A Concept Too Many', *Econ. Hist. Rev.*, 2nd ser. XXXVI (1983), 435–48 and Rab Houston & K.D.M. Snell, 'Proto-Industrialization? Cottage Industry, Social Change, and Industrial Revolution', *Historical Journal*, 27 (1984), 473–92.

⁵⁸ R.G. Wilson, 'The Supremacy of the Yorkshire Cloth Industry in the Eighteenth Century' in Harte & Ponting, eds. *Textile History*, pp. 225–46 and Pat Hudson, 'Proto-industrialization: the case of the West Riding Wool Textile Industry in the 18th and early 19th centuries', *History Workshop*, Issue 12 (1981), pp. 34–61, both contain interesting comparisons with the west of England cloth industry.

⁵⁹ For a recent critical assessment of the limitations imposed by the new economic history, or the 'cliometric program', on the scope and content of research as revealed in several major studies, see Steven D. Wentworth, 'Marginalizing History – A Critique of the Cliometric Program in Economic History' (Ph.D. thesis, University of Uppsala, Sweden, 1984).